Project Title: Overcoming the Electronic Health Record gap in the Outpatient department for Out Patients prescription without changing clinician behavior or existing workflows.

- **Project Implementation Date:** June, 2018.
- **Name of Applicant Organization:** Nanavati Super Specialty Hospital
- **Organization Address:** SV Road, Vile Parle West, Mumbai, Maharashtra 400056
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- **Application Prepared On:** 15th September 2019.

Executive Summary

Nanavati Hospital embarked on a project to digitize its outpatient department doctor prescription for patients during consultation visits, in late 2017. External drivers included new laws that mandate patient data to be digitally recorded and stored. Internally, the growth in patient visits, the need to engage more effectively with the patient and to bolster R&D efforts with real-world data led the management to prioritize the search for a sustainable, cost-effective solution.

In July 2018, Nanavati Hospital went live with an AI-powered data capture technology that allows clinicians to instantly digitize their case sheets using a digital pen and encoded paper. Patient can view his or her prescription on tablet kept at consultant desk in real time, while doctor is documenting the prescription. After completion of prescription within 1 minute patient will receive link of his or her prescription through SMS. Patient can download prescription in pdf and can save. Smart, contextual triggers based on what the clinician has advised are sent to 7 departments in real-time: Admissions, CT, MRI, Sonography, Follow-Up Consultation, Lab and Pharmacy so that scheduling and appointments can be planned for patients accordingly.

Hospitals in India currently attempt digitization with manual transcription or scanning. Such processes are often resource intensive, expensive and time consuming. Not all sheets can be scanned, as not all patients can be approached before they walk out. Existing EHR solutions require typing, tapping or speaking. As this involves unfamiliar multi-tasking and increases consult times, adoption rates are extremely low.

The solution proposed was successfully implemented and integrated with the existing HIS. There was zero downtime and training per user on average lasted 15 minutes. Clinician compliance was 100% as users did not need to change their behaviour or alter existing workflows. Specialty-specific and clinician-friendly structured templates have further increased compliance and the volume of data captured, ensuring guidance and consistency in following clinical protocol. Clinicians can now retrieve patient history simply by tapping their pen on paper. Real-time intra-department alerts from the OPD have significantly improved patient experience and has the potential to increase average revenue per patient. The management is empowered with automated daily and monthly MIS reports allowing them to leapfrog any prior gaps or lag in electronic health record adoption.

1.1 PROBLEM STATEMENT (Key drivers for the project):

Nanavati Hospital had embarked on a project to digitize its outpatient doctor prescription in late 2017. The digitization effort was made an urgent priority due to following factors:

1. Outpatient doctor prescription was not stored in Medical Record Department as a hard copy due to constraint of space and absence of process.
2. NABH 4th edition defined storage and retrieval of outpatient doctor prescription as one of the compliance requirement which was not implemented.
3. Doctors were not ready and were resistant to adapt to electronic medical record software.
4. Doctors did not had access to patient previous OPD prescriptions, if patient forget to bring previous prescription.
5. As hospital did not had mechanism to collect and store the outpatient prescription, there were no possibility to work on CLINICAL BIG DATA analysis and research projects in various specialties.
6. Outpatient revenue loss as patient could not get appointment scheduling proactively, as the doctor's order in prescription were manually documented on paper.
7. ABSENCE of outpatient engagement and service delivery after OPD consultation as compared to In patient engagement post discharge which was implemented due to availability of discharge summary in hospital information system.
8. Absence of process, system and mechanism due to which the prescription audit of doctors was not being conducted effectively.
9. Due to single hard copy documentation of OPD patient prescription, medical administration did not had any tool to conduct clinical privilege compliance audit of various practicing doctors. To assess whether those doctors are prescribing treatment as per their clinical privileges or not.
10. Absence of a comprehensive simple digital solution which can be easily adapted by doctors in Indian context for digital capture of outpatient prescription. For which various available options were evaluated:

S.No.	Potential Solution to Digitise Patient Records	PROs (FOR)	CONs (AGAINST)
1	*Electronic Medical Records (EMR) System*	Potential to capture high quality and structured data directly into system at point of care.	Input devices involve a keyboard and screen - which can take doctor's attention away from the patient and increase consult times. Doctors are also not comfortable with typing in general and/or dealing with complex user interfaces, high number of mandatory input fields.
2	*Carbon Copy Sheets and/or Scanning* *with Transcription Off-Site*	Use of regular pen and paper which is familiar to doctors. Cost-effective in terms of direct costs.	Data is not immediately captured into EMR - Unable to use real-time data based workflows. Not all sheets can be scanned (if no

S.No.	Potential Solution to Digitise Patient Records	PROs (FOR)	CONs (AGAINST)
			carbon copy) Requires manual transcription which can be costly and cumbersome.
3	*Transcriptionist On-Site in Doctor's Consulting Room*	Potential to capture high quality and structured data directly into system at point of care without affecting doctor's time and patient attention.	Expensive to hire transcriptionists for every doctor or scheduled consultation. Patients may not be comfortable with a 3rd person in the room.
4	*Stylus Pen with Tablet*	Paperless and instant digitisation at point of care. Potential to capture high quality and structured data directly into system.	Haptic feedback from stylus pen does not allow for comfortable free-form writing at the desired speed. With high patient loads, patients requiring hard copies have to wait in queue for print outs.
5	*Digital Pen (Ball point ink) with Encoded Paper*	Use of digital pen which weighs and holds like a regular pen. Use of paper which is familiar to doctors. Instant digitisation at point of care without changing existing workflows. Cost-effective.	Full transcription takes some time even with handwriting recognition algorithms. However, real-time data based workflows are unaffected.
6	*Speech to Text - Audio Recording & Off-Site Transcription*	Does not interrupt the doctor's workflow and attention for patient. Doctor can use either pen/paper or PC to enter data as per convenience.	Expensive solution to outsource. Patient consent for this form of data capture may not be as forthcoming. Data is not immediately captured into EMR - Unable to use real-time data based workflows.
7	*Speech to Text - AI powered On-Site Recording and Transcription*	Doctor can see transcription in real-time and make edits / sign off on accuracy.	AI is not accurate enough to parse clinical data from conversations - this can increase the load on the doctor. Noisy environments, infrastructure challenges and solution costs are further constraints.

1.2 Details of Solution Implemented (Instantly digitizing case sheets using digital pen and coded paper):

1. In July 2018, Nanavati Hospital went live with Doxper which is an Artificial Intelligence powered data capture solution that allows clinicians to instantly digitise their clinical notes using a smart digital pen and encoded paper.
2. The encoded paper serves as a fully customisable proxy for the clinician's keyboard and display. Machine learning is applied on a handwriting recognition engine which improves its accuracy over time.
3. After completion of prescription within one-minute patient receives the SMS link of the prescription in his registered mobile number. Patient can download the prescription as pdf file and can attach to his email or any messaging system and access or can share with any one easily within minutes of his consultation with doctor.
4. Smart, contextual triggers based on what the clinician has written and advised are sent to 8 departments in real-time: Admissions, Financial Counselling, CT, MRI, Sonography, Follow-Up Consultation, Lab and Pharmacy.
5. With a few clicks, respective department personnel can view the clinician's case sheet, contact the patient to address any queries and book an appointment - as this happens in near real-time, the patient is served before they leave the busy hospital, thereby creating a WOW patient experience.
6. For each department for which services was prescribed in digital prescription; respective staff can attend the lead in tablets and can document the action taken response with respect to appointment scheduled or patient requested for another date etc. which enabled hospital to track the patient retention in hospital for other services and has enhanced the OPD revenue retention with in the hospital.
7. It enabled to generate MIS on the status of all services prescribed and its delivery to patient.

Introducing Doxper - Digitisation without behaviour change. Cloud based and silo free.

WRITE

Write with Doxper **digital pen** on regular **encoded** paper.

SYNC

Data syncs with app on phone or tablet in **real-time** via Bluetooth.

PROCESS

Processed in **cloud** with AI powered **handwriting recognition.**

Zero workflow change and downtime for hospitals. Intuitive integration with existing HIS/ HMIS.

Private & Confidential

doxper

Doxper Workflow at Nanavati

No Workflow Change

REGISTRATION COUNTER

Patient registered in **HIS** Print command entered

Case sheet is printed with:

From Doxper's Cloud
1. Doctor's template
2. Unique sheet codes

+

From Hospital HIS
3. Patient Name, UHID, Age, Gender, Doctor Name, Mobile Number, Visit Date...

Patient Bill receipt printed

No Behaviour Change

DOCTOR'S CONSULTING ROOM

Doctor writes on case sheet and signs.

Doxper Cloud Processing

In Real-time for checkboxes and digital image

Hospital HIS updated with mapped data fields under UHID

Hospital HIS updated with digital image of case sheet under UHID

Real-time Engagement & Data Flow

PATIENT

Patient receives custom SMS and digital copy of case sheet: Dear___, thank you for visiting___.

HOSPITAL DEPARTMENTS
Pharmacy, Lab, Admissions etc

Department receives notification if trigger conditions are met such as meds written, lab tests advised etc

Person I/C views patient case sheet

Updates and clears queue as per customisable workflow for e.g. Meds ready, delivered, Appt. given, Not interested etc

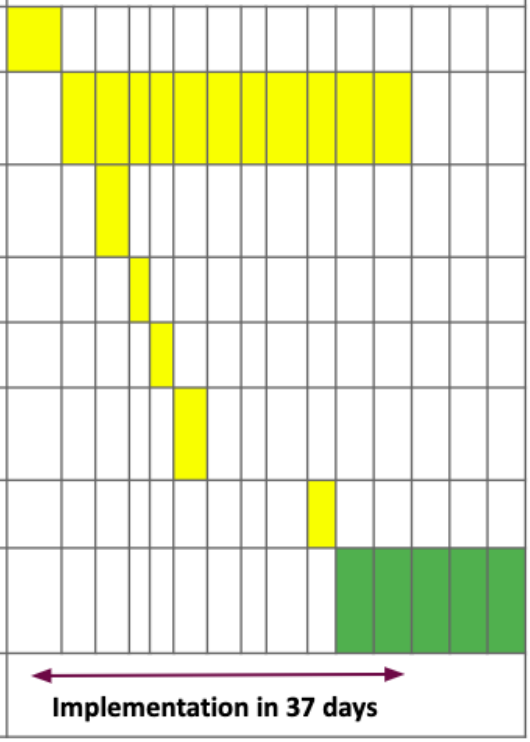
Option to directly **call patient** from screen

HOSPITAL ADMINISTRATOR

Monitor service leads from OPD
Centralised monitoring of OPD status

doxper

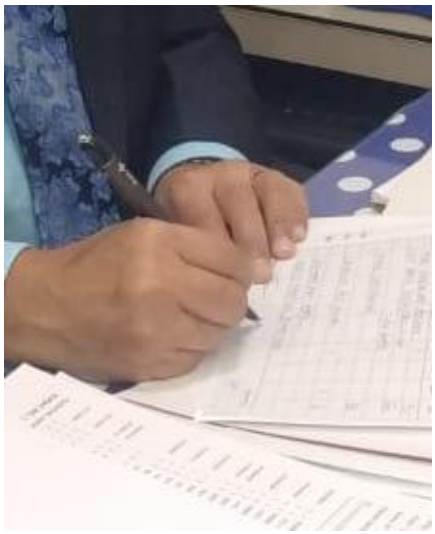
8.Implementation steps and duration:

		Man Days	
Implement	**Open House** with full workflow simulation	7	
	Template Designing - active collaboration with consultants	30	
	Inspection and Simulation of registration desks to identify ideal printer locations	3	
	Integration with EMR - 1st pass	1	
	Virtual Printer with system integration	2	
	Dashboard for OPD alerts for department personnel and administrators	3	
	Printer Installation and final testing	2	
Go-Live	**Training & Rollout** (as per clinician's regular schedule) - **15 mins per clinician**	15	
			Implementation in 37 days

9.The project is a major improvement over previous systems and workflows in the following ways:

1. **Affordability & Cost-Effectiveness:** There was minimal one time hardware investment of digital pen +tablet + WI Fi + high end laser printer between two registration staff. Recurring overall costs are less than 3% of revenues from the outpatient department.
2. **Replicability:** The system is seamlessly connected end to end from hospital's existing HIS to the cloud. Any additions such as new OPD chambers, new clinicians or new templates are added with zero downtime, and without compromising performance. Case sheets with the clinician's template, patient details and unique codes for the sheet are all simultaneously printed on-site at the time of patient registration. There is no extra effort to account for additions to staff, infrastructure or patient volume.
3. **Sustainability:** There is no change required in the behaviour of clinicians or with existing workflows. Poor adoption due to resistance against change is often the main reason for new HIT systems eventually failing.

10.Testing and Deployment: More images in Appendix B



11.Clinical and operational benefits

I. 100% compliance because of zero behaviour change and zero cognitive load

The technology deployed has 100% buy-in from clinicians as it does not require any change in behaviour. Minimal training is involved, just switch the pen on and start writing. Pen is lightweight, feels like any normal pen and lasts for 5 hours of continuous writing on a single charge. Slide the pen in the dock once you are done, so it stays charged for the next clinician.

II. Clinician specific and balanced templates for clinically decisive consultations

Prior to the technology deployment, most consultants, including specialists and super-specialists were writing on blank, standardised case sheets. Using a digital pen and encoded paper solution created the opportunity to create clinician-specific templates (that are printed on-demand at the time of patient registration) **and** balanced templates with the right mix of structured and free-hand fields. Overall, this greatly increased the comfort level of clinicians (they can write notes the way they are used to, annotate or draw), without compromising the capture of meaningful, actionable data. The structured fields also serve as useful prompts to allow proper clinical protocol to be followed consistently, regardless of how busy the practice is, or how complex the case presented is. See **Appendix B** for two such template examples.

Changes in templates can be mapped in a matter of days, with zero downtime during the transition. The user interface of typical EHR systems, do not have the same level of flexibility and customisation available for users.

III. Retrieving patient history intuitively

When a follow-up patient visits a clinician, simply by touching the pen on the paper, the patient is identified on the Bluetooth connected tablet. The clinician can swipe the screen to view case sheets of prior visits. There is no need to type the patient name, or scan any codes. Intuitive access to patient history, together with the 100% compliance rate has resulted in significantly higher quality of consults and advice. Patients are no longer burdened with carrying their files.

IV. Contextual, real-time patient engagement

Real-time department alerts are generated based on the content of what the clinician has written on the OPD case sheets. These alerts are allowing coordinated care between the outpatient department and the 7 hospital services such as Pharmacy, Investigations, Admissions et al. Based on these alerts, the relevant hospital team is getting an opportunity to engage with the patient to address the advice made by the OPD consultants. It is too early in our implementation to see how capturing all possible leads for in-house services and acting quickly will meaningfully increase average revenue per patient, but the potential looks promising.

V. Insights from clinical and operational data

Structured data from the solution is automatically generated into daily and monthly MIS reports, giving management the tools to make informed tactical decisions on day to day operations. Longitudinal clinical data can reveal patterns and trends to allow the hospital to better respond to needs of the local population. The volume of data and ease of access is unprecedented in the Indian context and is allowing our hospital to leapfrog the gap and lag in EMR adoption. **Appendix C** shows representative examples for both.

12.Training, support and maintenance:

Training for clinicians introduced to the system for the first time could be completed within 15 minutes, just before they were about to start their day, without any major disruptions, and without the need to organise separate training sessions. For busy, visiting consultants, this was a major relief. All clinicians were given the opportunity to visit a full simulation during a week long ‘Open House’, setup in a conference room.

Close hand-holding and issue resolution happened on-site for the first 30 days from implementation up to satisfactory stabilisation. On-site support will continue to be provided by the in-house hospital team and remotely by the Doxper tech support team. In addition Doxper field support team is available whenever needed.

13.Adoption Rate:

1. Out of a total pool of 225 clinicians indexed in the hospital information system, 80% have already started using the solution. Clinician adoption among those already trained and introduced to the system is 100%.

2. Since going live in July 2018, more than 16000 patients have been served with over 27000 case sheets generated and digitised.

3. 37 tertiary care templates have been designed and mapped successfully in close collaboration with leading, world-class specialists and super-specialists.

4. Feedback from the clinicians was overwhelmingly positive and can be found narrated in **Appendix D**.

1.3 Outcomes Achieved:

1. The prime objective was to immediately comply with the accreditation requirement for record keeping of OPD case sheets as per NABH (National Accreditation Board for Hospitals & Healthcare Providers) standards was complied and achieved without planning and provision of physical space, infrastructure and manpower for management of OPD prescriptions.

2. Seamless integration with HIS for capture of patient demographic details and unique ID generation. This was ACHIEVED with a single step process. Patient demographics from the HIS were merged with unique one-time codes and clinician specific templates from the Doxper cloud, and simultaneously printed with a single command.

3. Prescription were printed with doctor name, doctor MMC registration number, speciality and patient details as per HIS records of billing and patient registration records.

4. Patient got the SMS link after one minute of consultation, the SMS link provides the patient's prescription in his smart phone in pdf format so that patient can record and refer anywhere digitally. It created a uniform access to patient to his OPD medical record and brought WOW patient experience in the OPD consultation process.

5. Timely retrieval of digitized case sheets from the system without any manual intervention. ACHIEVED. All OPD patient prescriptions was available in web-based software on desktop in consultation room at doctor desk.

6. Implementation of structured specialty specific clinical templates for patient assessment on outpatient basis to ensure each clinician's compliance and adoption. ACHIEVED. Digitization of BIG CLINICAL DATA was achieved for research purposes and clinical studies speciality wise doctor wise.

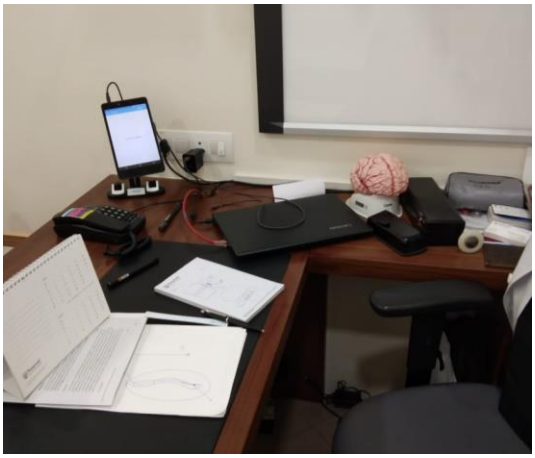
7. Introducing a new design and response process for the patient to enhance the patient experience based on the data and alerts defined in the templates for 8 different departments: Follow-up consultation, Pharmacy, Admissions, financial counselling, CT, MRI, Sonography and Pathology Lab. ACHIEVED.

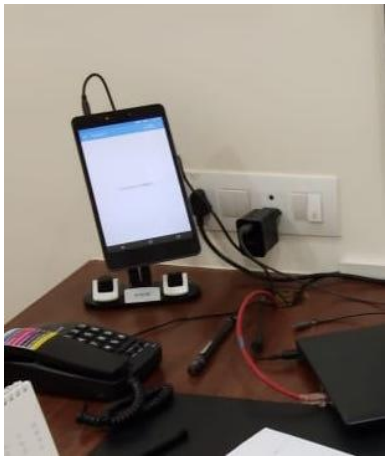
8. Requirement for a daily MIS report that was automated, detailed and organised clinician-wise. ACHIEVED.

9. Each Stakeholder WON:

Provider	Patient	Wider Ecosystem
Clinicians & Nurses No behaviour change Custom templates Easy access to patient files and history **Patient Engagement** Automated follow-up, adherence and patient education SMS messages **Hospital Administrator** Detect and plug revenue leakages Comply with regulations, quality audits Engage in clinical research **IT Department** Zero Downtime < 15 mins to train Seamless integration	**Patient Experience** Get the doctor's undivided attention - in the clinic and at home with care providers **Record Keeping** Patient has their own digital case record via SMS **Patient Journey** Seamlessly navigate hospital's services	**Analytics & Insights** Care coordination post-consult Antibiotics resistance Longitudinal data in spite of EMR silos Real-time, accurate data from the field **Policy & Regulation** Data on NCD and notifiable diseases - Prevent potential epidemics Complete disease registries - Prescribing Behaviours for analytics Detect and Prevent Fraud Use real-world evidence to regulate and accelerate clinical trials

Appendix A: Images of solution, and during testing and deployment





Appendix B: Specialty specific templates with optimal mix of structured and free-hand fields

Nanavati
Super Speciality Hospital
a passion for healing...

OPD ASSESSMENT - JOINT REPLACEMENT SURGERY

Patient Name : **UHID No :**

Date/Time : **Age/Gender:** **Mobile No. :**

Sponsor :

Consult. Start Time: _____ Allergic to: _____ Temp (°C): _____

Fall Risk Screening: _____ Nutri Screening: _____ (if applicable) Pain Score (0-10): _____

VITAL SIGNS (As applicable)

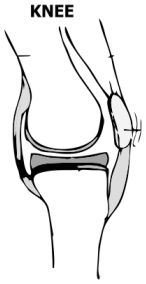
BP (mm/Hg): Sys _____ / Dias _____ Pulse (/min): _____ Height (cms): _____

Weight (kg): _____ Resp. Rate (/min): _____

JOINT EVALUATION:

KNEE JOINT:

KNEE

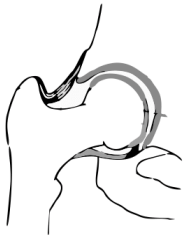


Pain Intensity			Current State		Deformity			Cause of Symptom		
Minimum	Right	Left	Worsening	If Yes	None	Right	Left	Spontaneous	Right	Left
Mild	Right	Left	Rest Pain	If Yes	Varus	Right	Left	Twisting Injury	Right	Left
Moderate	Right	Left	Hist. of Trauma	If Yes	Valgus	Right	Left	Contusion	Right	Left
Severe	Right	Left	Severe	If Yes	Flex	Right	Left	Fracture	Right	Left
					Comb	Right	Left	Work Related	Right	Left
								Fall	Right	Left
								Accident	Right	Left
								Others	Right	Left

Other points: _____

HIP JOINT:

HIP



Pain Intensity			Current State		Location			Cause of Symptom		
Minimum	Right	Left	Worsening	If Yes	Groin	Right	Left	Spontaneous	Right	Left
Mild	Right	Left	Rest Pain	If Yes	Lateral	Right	Left	Twisting Injury	Right	Left
Moderate	Right	Left	Hist. of Trauma	If Yes	Thigh	Right	Left	Contusion	Right	Left
Severe	Right	Left	Previous Surgery	If Yes	Knee	Right	Left	Fracture	Right	Left
								Work Related	Right	Left
								Fall	Right	Left
								Accident	Right	Left
								Others	Right	Left

Other points: _____

CLINICAL NOTES: _____

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Managed by Radiant Lifecare

SYSTEMIC EXAMINATION (System applicable):

CVS: _____ Abdomen: _____ CNS: _____ Resp. System: _____

INVESTIGATIONS ADVISED:

LAB TESTS:

- ☐ CBC
- ☐ Blood Group
- ☐ HbA1C
- ☐ Hb
- ☐ ESR
- ☐ CRP
- ☐ BUN, BSL - Fasting
- ☐ BSL - PLBS
- ☐ INR
- ☐ Sr. Creatinine
- ☐ LFT
- ☐ HLAB27
- ☐ HIV
- ☐ HBsAg
- ☐ HCV
- ☐ Sr. Vit+D3
- ☐ RA Test
- ☐ Urine R & M
- ☐ T3, T4, TSH

IMAGING TESTS:

X-Ray

- ☐ Chest PA
- ☐ Knee AP Standing
- ☐ Knee Lateral
- ☐ L.S. Spine AP
- ☐ L.S. Spine Lateral
- ☐ PBH AP
- ☐ Alignment AP (Scanogram-Hip to Ankle)

- ☐ ECG
- ☐ 2D Echo
- ☐ PFT

PROVISIONAL DIAGNOSIS: _____

CARE PLAN: _____

Admission Advised: ☐ If yes **Anesthesia Fitness:** ☐ If yes **Surgery Advised:** ☐ If yes

PRESCRIPTION

Sr. No.	MEDICINE (WRITE IN CAPITAL)	Dose	Morn	Noon	Night	Days

Consultant Seal & Signature

Consultant Name: _____

FOLLOW UP DATE

DD / MM / YYYY

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TOTAL KNEE REPLACEMENT

☐ Primary ☐ Revision

☐ Left Knee ☐ Right Knee

Date of Surgery: DD / MM / YYYY At: NSSH Outside

Prosthesis: ☐ PS ☐ CR ☐ Revision LCCK RHK

Stem: ☐ Tibia ☐ Femur

Infection: Sinus

PAST HISTORY:

Surgery:

Scar: Healed Not Healed

ROM: 0-45 0-90 0-120 120-140

Fixed Deformity:

Varus	Degree	<10	10-30	<30
Valgus	Degree	<10	10-30	<30
Flexion	Degree	<10	10-30	<30

Tenderness: Joint Line If Yes Tibia If Yes Femur If Yes Patella If Yes

Instability If Yes

Medial		Lateral	
<10 deg	>10 deg	<10 deg	>10 deg

Patellar Tracking: Painful If Yes

Lateral Subluxation If Yes

Walking Aid No Stick Walker

Physiotherapy If Yes

Remarks:

TOTAL HIP REPLACEMENT

☐ Primary ☐ Revision

☐ Left Hip ☐ Right Hip

Date of Surgery: DD / MM / YYYY At: NSSH Outside _____

Prosthesis: Cemented Hybrid Cementless

Head Size:					
	Ceramic	36	32	28	22
	Metal	36	32	28	22

ROM:					
	Flexion	0-30	0-60	0-90	0-120
	Abduction	0	0-30	0-45	
	Adduction	0	0-30	0-45	
	Int. Rotation	0	0-20	0-40	
	Ext. Rotation	0	0-20	0-40	

PAST HISTORY:

Limb Length:	Left		Right	
	Short	Long	Short	Long
	0-10 mm	0-10 mm	0-10 mm	0-10 mm
	10-20 mm	10-20 mm	10-20 mm	10-20 mm

Walking Aid: If Yes Stick Walker

Physiotherapy: If Yes

Remarks: _____

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OPD ASSESSMENT - CARDIOLOGY

Patient Name : **UHID No :**

Date/Time : **Age/Gender:** **Mobile No. :**

Sponsor :

Consult. Start Time: _____ Allergic to: _____ Temp (°C): _____

Fall Risk Screening: _____ Nutri Screening: _____ (if applicable) Pain Score (0-10): _____

VITAL SIGNS (As applicable)

BP (mm/Hg): Sys / Dias Pulse (/min): _____ Height (cms): _____

Weight (kg): _____ Resp. Rate (/min): _____

PRESENTING COMPLAINTS WITH DURATION:

Chest Pain	If Yes	Duration	Oedema Feet	If Yes	Duration
Dyspnea	If Yes	Duration	Syncope	If Yes	Duration
Fatigue	If Yes	Duration	Cough	If Yes	Duration
Palpitation	If Yes	Duration	Intermittent Claudication / Extremely Pain	If Yes	Duration

Type of Pain: Typical Angina Atypical Angina Non Anginal Pain

_____

_____

_____

_____

Risk Factor Profile

☐ Family History	☐ HTN	☐ DM	☐ Dyslipid	☐ CKD	☐ COPD
☐ Alcohol	☐ Hypo-Thyroid	☐ Smoking	☐ OSA	☐ Obesity	☐ Other _____

PAST HISTORY:

Rheumatic Fever If Yes On Rheumatic Propylaxis Prior IHD If Yes Prior CAG/Intervention If Yes

Prior Cardiac Surgery If Yes Other (Specify): If Yes _____

Details: _____

_____

_____

PREVIOUS INTERVENTION & DETAILS:

Thrombolysis: _____

CAG: Year Findings: _____

PCI: Year Vessels: _____ Stents: _____

CABG: Year Findings: _____

ICD/CRT/PPI: _____

Peripheral/Aorta/Intravenous: _____

Others: _____

PREVIOUS INVESTIGATIONS:

CBC: _____

Creat.: _____

HIV, HBsAg, Anti HCV _____

Total Ck.: _____

Sr. Electrolyte: _____

BNP/NT Pro BNP: _____

Trop T/I: _____

ECG: _____

SGPT: _____

X-Ray Chest PA: _____

Lipid Profile:

TG: _____

TC: _____

HDL: _____

LDL: _____

Non HDL: _____

Others: _____

2D Echo: _____

CLINICAL EVALUATION:

☐ Rhythm ☐ Pallor ☐ Edema ☐ Ascites

BMI _____ JVP _____ HR _____ (R) SpO2 _____

CVS: _____

Respiratory System: _____

Peripheral Pulses	Right	Left	Popliteal	Right	Left
Carotid Bruit	Right	Left	DIP	Right	Left
Radial	Right	Left	PT	Right	Left
Brachial	Right	Left	Gangrene	Right	Left
Femoral	Right	Left			

PROVISIONAL DIAGNOSIS: _____

_____

_____

_____

FOLLOWUP / ADVICE: _____

_____

_____

_____

_____

INVESTIGATIONS ADVISED:

- ☐ CBC
- ☐ Blood-Sugar
  - ☐ F
  - ☐ PP
  - ☐ HbA1c
- ☐ S. Electrolytes
- ☐ Creatinine
- ☐ Lipid Profile
- ☐ HIV
- ☐ HBsAg
- ☐ Anti HCV
- ☐ RFT
- ☐ LFT
- ☐ Vit D
- ☐ Vit B12
- ☐ T3, T4, TSH
- ☐ Urine R/M
- ☐ Urine C & S

- ☐ ECG
- ☐ 2D Echo
- ☐ Stress Test
- ☐ ABP
- ☐ Holter
- ☐ Dobutamine Stress Echo
- ☐ Perfusion Study
- ☐ Viability Study

Doppler Studies

- ☐ Arterial Doppler
- ☐ Venous Doppler
- ☐ Renal Doppler

X-Ray

- ☐ Chest PA

Others:

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

Admission Advised: If Yes

Procedure Advised: If Yes

PRESCRIPTION

Sr. No.	MEDICINE (WRITE IN CAPITAL)	Dose	Morn	Noon	Night	Days

Consultant Seal & Signature

Consultant Name: _____

FOLLOW UP DATE

DD / MM / YYYY

Appendix C: Representative Monthly MIS Report & Clinical Data Analysis

Doxper id	Patient Name	MRD_NO	DATE	VISIT_ID	DR_ID	Admission	CT	Follow_up	Lab	MRI	Pharmacy	Sonography	Surgery	XRay
	Total	7436				237	71	717	1412	95	2893	203	241	319
Doxper id	Patient Name	MRD_NO	DATE	VISIT_ID	DR_ID	Admission	CT	Follow_up	Lab	MRI	Pharmacy	Sonography	Surgery	XRay
[redacted]			2018-08-01	844817	[redacted]									
			2018-08-01	844824				Y	Y		Y			
			2018-08-01	844828										
			2018-08-01	844834										
			2018-08-01	844840		Y					Y		Y	
			2018-08-01	844847										
			2018-08-01	844851		Y			Y		Y		Y	Y
			2018-08-01	844862		Y					Y		Y	
			2018-08-01	844868										
			2018-08-01	844871										
			2018-08-01	844876										
			2018-08-01	844886		Y					Y		Y	
			2018-08-14	844895							Y		Y	
			2018-08-01	844900				Y			Y			
			2018-08-01	844899					Y			Y		Y
			2018-08-29	844903				Y	Y		Y			
			2018-08-01	844904										
			2018-08-01	844907										
			2018-08-01	844911				Y			Y			
			2018-08-01	844914							Y			
			2018-08-01	844918										
			2018-08-01	844922					Y					
			2018-08-01	844927		Y					Y			
			2018-08-04	844932										

DATA TRANSCRIPTION FOR STRUCTURED FIELDS

S.No	Name	ID	Date	Age (years)	Sex	Weight (kg)	Mobile	Hb (g/dL)	Urea (mg/dL)	Creatinine (mg/dL)	Calcium (mg/dL)	Phosphorous (mg/dL)	Urine:Protein (mg/dL)	Pus cells (p.v.f)	RBCs (hbf)	Heart Trouble	Anaemia	Diabetes	Asthma	Cardiac Pace Maker	Sinus	Jaundice	TB
1	[redacted]	R1234	12/11/13	56	F	78	[redacted]	10.2	7	0.6	8.5		3			Y	N	N	N	N	N	N	N
2		M12	13/11/13	23	M	56		12				2.5		0		N	N	N	N	N	N	N	N
3		AP2	14/01/14	34	M					1	10.2				1	N	N	N	Y	N	N	N	N
4		A89	15/11/14		M	56						4.5	3			N	N	N	N	N	N	N	N
5		AS4	16/11/14	27	M				8		9					N	N	N	N	N	N	N	N
6			17/11/14	38		78					9.4		17		2	N	N	Y	N	N	N	N	N
7		AG23	18/11/14	29	M			16				1		4		N	N	N	N	N	N	N	N
8		AV23	19/11/14	67	M	97				1.1						N	N	N	N	N	Y	N	N
9		BS23	20/11/15	56	F	67										N	N	N	N	N	N	N	N
10		DS56	21/11/15	24				13.2	18		10.2		9			N	N	N	N	N	N	N	N
11		DS2		48	M	57				0.8						N	N	N	N	N	N	N	N
12		DR56	23/11/15	39	M	78						3.2				N	Y	N	N	N	N	N	N
13		DS45	24/11/16	45	M			14.1	5					5		N	N	N	N	N	N	N	N
14		GT78		46	F	67					8		18		1	N	N	N	N	N	N	Y	N
15		HS2	26/11/16		M							4.2				N	N	Y	N	Y	N	N	N
16			27/11/16	27	F	56		9		1.2						N	N	N	N	N	N	N	N
17		JC56	28/11/16	38	M	67			18							N	N	N	N	N	N	N	N
18		K23	29/11/16	68	M	67		8			9			2		N	N	N	Y	N	N	N	N
19		N356	30/11/16	70	M	56			7				22			N	N	N	N	N	N	Y	N
20		VS34	01/12/16	23	M	45				1		3		1		N	N	N	N	N	N	N	N

Appendix D: Clinician's Feedback

SN	Speciality	Consultant Name	Consultant Feedback	Specific Prescription Required?
1	Bariatric Surgery	Dr. Jaydeep Palep	Excellent initiative, willing to adopt to it. Currently typing	Currently typing in word . Yes Specific prescription required.
2	Endocrinology	Dr. Mihir S Raut	Willing to adapt to it , need to design opd prescription as per endocrinology.	Yes.
3	ENT	Dr. Manohar Shaan	Good initiative, need ENT specific opd prescription.	Yes.
4	General Medicine	Dr. Harshad S Limaye	Good Initiative. OPD template as per his specifications.	Yes.
5	General Medicine	Dr.Rahul Tambe	Good Initiative. OPD template as per his specifications.	Yes.
6	Gynaecology	Dr. Gayatri Deshpande	Good initiative, need gynecology template.	Yes.
7	Gynaecology	Dr. Preeti D Galvankar / Dr.Nirmal	Good initiative, need gynecology template.	Yes.
8	Hand Surgery	Dr. Aditya Kaushik	Good work flow.	Yes.
9	Interventional Cardiology	Dr. Salil Shirodkar	excellent initiative, need cardiology specific template.	Yes.
10	Minimal Access Surgery	Dr. Manmohan Kamat	Need general surgery specific template.	Yes.
11	Nephrology	Dr. Anup Chaudhary / Dr.Harish Pathak	Excellent initiative, need nephrology specific template even for AKD patients charting.	Yes.
12	Neuro Surgery	Dr. Rajan Shah	Recommended to have speech recognition for template documentation. Ready to adopt. Good initiative.	No.
13	Orthopaedics - Joint Replacement	Dr. Pradeep Bhosale	Need joint replacement specific opd prescription template and also for surgery notes and diagrams. Good initiative.	Yes.
14	Orthopaedics - Joint	Dr. Sunil M Shahane	Good initiative. Will adopt it.	Yes.

SN	Speciality	Consultant Name	Consultant Feedback	Specific Prescription Required?
	Replacement			
15	Radiation Oncology	Dr. Nagaraj G Huilgol	Good workflow but meets only administrative purpose of prescription tracking for revenue.	No.
16	Spine Surgery	Dr. Mihir Bapat	Excellent work flow. Needs his specific prescription design. Also needs for surgery notes.	Yes.
17	Spine Surgery	Dr. Amandeep Gujral	Excellent work flow. Needs his specific prescription design. Also needs for surgery notes.	Yes.
18	Spine Surgery	Dr. Nikhil Arbatti	Good work flow. Willing to adopt to it.	No.
19	Surgical Oncology	Dr. Sudeep Sarkar	Good work flow. Need surgical oncology specific opd template and surgeon notes also.	Yes.
20	Urology and Uro Oncology	Dr.Avanish Arora	Recommended to have the full fledged EMR. Contented with the workflow demo.	Yes.