

Online Specialist Outreach Clinics via Telemedicine Van

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Introduction

Shortage of Specialists in the suburban and rural areas of most developing countries is posing a serious threat to Healthcare. Medical Professionals falling short in numbers globally in the face of rising population is creating wide gaps in the healthcare services with the problem touching a critical value.

The author takes a look at the Telemedicine based solution to the problem, proposing a service design. The problem and solution are both discussed by the author who segregates the topic into various sections such as “Problem, Solution, Service, Impact, Execution etc.



Problem

Deficient Specialist Healthcare Services in Developing Countries

Negative Impact on Healthcare

- Delayed diagnosis of medical conditions
- Late initiation of medical treatment
- Poor quality healthcare outcome (higher patient morbidity & mortality)
- Higher cost of care leading to poverty
- The social burden on family and society

The Solution

Online Specialist Outreach Clinics via Telemedicine Van

Bridging Specialists & Patients across distance

A customized, high technology Telemedicine van fits the requirements to serve as an “ONLINE SPECIALIST OUTREACH CLINICS on Wheels”, equipped with Telemedicine Gadgets embedded within an environment of Clinical Telemedicine Software.



Elements of Online Specialist Outreach Clinics

The Mobile Clinic Staff (3 Members)

Telemedicine Clinic Physician

For primary examination to filter patients, while serving three additional roles:

- Trained Telemedicine Software Operator
- Licensed Prescription Writer
- An Interpreter if need be

Telemedicine Clinic Technician

Triage Manager performing the following tasks:

- Patient Registration

- Basic Information Entry
- Online Medical Records Management

Telemedicine Van Driver

- Experienced Van Driver
- Basic mechanic skills
- Door Guard during the Clinic proceedings



The Clinical Telemedicine Software Parameters

1. Real-Time Specialist & Patient Secure Video Meeting via a Clinical Telemedicine Software
2. Each Teleconsultation Record available for review at follow-up
3. Availability of Ultrasound Scanner and Telemedicine Devices to convey clinical information to Online Specialist
4. Prescription writing, Referral and Investigation request facility like standard practice
5. Clinical Decision Support System to support Clinical Examination on Recommended Guidelines
6. Quality Control Audit and Clinical Governance Tools
7. Disease Surveillance Toolkit embedded for Statistical Data Studies

Interface of the Speciality Tele-outpatient Clinic Software



The Impact of the Solution

Beneficial for the Patients

1. Timely availability of Healthcare Specialist for

early diagnosis

2. High-level Specialist Expertise available from within and outside country
3. Reduced Travelling costs and Inconvenience for the patients
4. Patient Healthcare records initiated and maintained
 - Available for the follow-up appointments
 - Exportable to another specialist if required
 - Data analysis for Disease Prevalence Studies

Positive Impact on the Clinicians

1. New Jobs created for the Specialists in the medical and surgical fields
2. Specialists operating from a central location without the need to travel out
3. Protection against air-borne communicable diseases (Respiratory Viral or Bacterial conditions)
 - Covid pandemic or other local endemic conditions such as seasonal flu
4. Higher Professional Satisfaction
 - Enhanced outreach and speedy availability of professional advice to needy patients
 - International expertise recognition in various cities and countries
 - Capacity building as a new skill set added in line with the Continuous Medical Education
5. Better Family Life as Time Management improves due to reduced travelling



Benefits to Government or Institutions as Healthcare Providers

1. Reduction of Disease Mortality Rates
 - Lowered Infant & Mother Mortality rate (prompt pick up of vulnerable cases)
 - Reduced Cardiac Disease Mortality rate (timely diagnosis of cardiac diseases)

- Lesser Cancer Death rate (early diagnosis of common cancers, e.g.: Skin, bowel, lungs etc)
- 2. Improved Quality of Healthcare
 - Reduced Patient Morbidity (timely diagnosis and treatment)
 - Decreased Infection transmission (reduced physical contact)
- 3. Enhanced Healthcare Governance
 - Cost-Efficient Management of Medical Professionals rostered time
 - Adherence to the Clinical Guidelines and Audit protocols
 - Precise Drugs Control and Meticulous Prescription Monitoring
- 4. Reduced Economical Burden on Government Hospitals
 - Prolonged hospitalization costs avoidable (more hospital beds available)
 - Reduced space and staffing requirements (outpatient clinics expandable in small costs)
 - Avoidable Reimbursement of patients travelling costs (wherever and if applicable)
 - Lowered Wastage of Healthcare Resources due to efficient Tele-monitoring
- 5. Climate-Friendly Healthcare System (shrinking of Carbon Footprint)
 - Reduced patient travelling (less fuel combustion in the atmosphere)
 - Reduced people crowding at the hospitals (lesser hospital traffic)
 - Paperless Healthcare Service (kinder to the environment while reducing paper waste)
 - Lesser disease transmission and healthier ambience

Design and Workflow of “Specialist Outpatient Clinics via Telemedicine Van”

Various range of Specialties can be served through the service.

Medical Specialties

- Tele-cardiology
- Tele-rheumatology
- Tele-endocrinology
- Tele-pulmonology
- Tele-nephrology
- Tele-gastroenterology
- Tele-dermatology



- Tele-paediatrics
- Tele-psychiatry
- Tele-neurology
- Tele-ultrasonography (Diagnostic)

Surgical Specialties

- Tele-Fracture Clinic
- Tele-Orthopaedics
- Tele-ENT Surgery
- Tele-Ophthalmology
- Tele-Gynaecology
- Tele-Urology
- Tele-Plastic Surgery
- Tele-Gen Surgery
- Tele-Neuro-surgery
- Tele-Dentistry
- Tele-Woundcare



Design off Online Specialist Outreach Clinics via Telemedicine Van

“Telemedicine Poly-Clinic on Wheels” is designed to serve 22 Specialities.



Telemedicine in a Box is designed to serve 12 Specialities where the Van is not required or not feasible.



Online Specialist Outreach Clinics via Telemedicine Van

The proposed Mobile Speciality Tele-outpatient Clinic service reaches out to patients in urban and suburban areas taking a Patient-Centric-Care approach.

Online Specialist Outreach Clinics via Telemedicine Van - an outline

- A vehicle, custom-fabricated, equipped with relevant medical gadgets incorporated within our Clinical Telemedicine Software
- A Team of 3 people travelling with the van: GP, Clinic Coordinator and Vehicle Driver
- Real-Time Connection of the van over High-Speed Internet with a team of Highly Qualified Specialists located at a central place to provide Medical Advice remotely
- One Group of Specialists to serve for 2-4 Telemedicine Vans simultaneously during one day's Mobile Tele-clinics schedule in suburban and rural areas
- Central Office Management schedules the Telemedicine Vans for visiting different locations, coordinating with the local government officials or private healthcare facilities taking part in the service



Medical Gadgetry fitted within the Telemedicine Van, a snapshot

Specialist Healthcare on the Wheels carrying Spot Medical Test Kits for common conditions would add significant value to a care delivery system.

- Fast Telemedicine configured PC with two large screens, connected on fast internet
- HD Webcam, High Fidelity Mic, Speakers, Lighting, Suitable Clinic Furniture
- Clinical Telemedicine Software with EMR capability, seamlessly embedding suitable medical gadgets such as:
- Telemed Stethoscope, Tele-spirometer, Tele-Glu-

cometer, Height & Weight scales,

- Pulse-oximeter, Thermometer
- Medical Cameras for ENT, Dental, Eye, Skin and General Examination
- Telemedicine configured Medical Ultrasound unit, Telemedicine configured 8 Parameters Vital Signs Monitoring system
- Document Scanner and Printer



Workflow of the Telemedicine Van Remote Consultation

Patients get Spot-appointments with the Specialists and after their review, medications get dispensed by the junior doctor at the patient's end.

- Telemed Van Assistant: General Patient Registration, Medical Records uploading
- Telemed Van GP: Primary Medical exam, Height/weight, BMI check, Filtration for the Spot Referrals to the relevant Specialist
- Tele-consultation with the Specialists:
- Clinical History - Review of the Medical Records - Patient's Visual Examination
- Medical Investigations via Spot Test Kits, ECG, Lung Function Test, Diabetes check
- Medical Cameras for ENT, Dental, Eye, Skin examination, 8 Vital Parameters for the Real-Time Assessment of patients
- Ultrasound examination for expectant mothers, cardiac or major blood vessels diseases, orthopaedic conditions etc



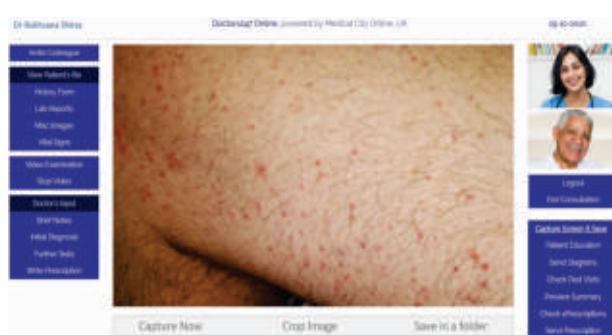
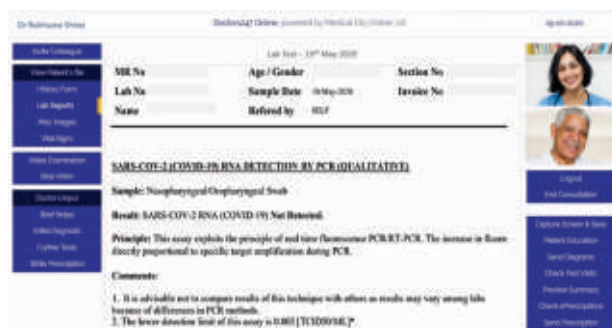
Summary of the Outcome of the remote Consultation with the Specialist

Patients get their Electronic Medical Records setup and every Tele-consultation gets saved as an Auto-summary in paper and electronic format.

- Building up of Electronic Medical Records Clinical Notes, Captured Images of Medical Findings, Short Video Clips of Vital Parameters Flow, Ultrasound Exam Clips, Teleconsultation's Auto-summary
- Treatment commenced
- Printed Prescription or wherever relevant, dispensing of medications by the doctor
- Referral to Hospital Out-patients
- For complicated cases, referral to Specialist Hospital Outpatients for hospital admission, CT/MRI or possible surgical intervention
- Follow up appointment
- Review appointment given if needed as per schedule of Mobile Clinic at that location
- Tele-consultation Summary + Education
- Short auto-summary printed for the patients if asked, Educational diagrams emailed to the patients or given in print if asked.



Some screenshots of a Clinical Decision support system based Telemedicine Software are shown as an example for the Medical Teleconsultations with a Specialist in the Telemedicine Van.



Web links to brief video clips of the Medical Teleconsultations are available below to get the feel of flow of Online Examination offered in above described design of ONLINE SPECIALIST OUTREACH CLINICS VIA TELEMEDICINE VAN.

Telecardiology: Remote Carotid Artery Scan

<https://youtu.be/EKQ73xWUFWA>

4 Chamber Remote Cardiac Scanning

<https://youtu.be/hsBc0LMRUF4>

Remote Liver Ultrasonography

<https://youtu.be/94L4-urVPUs>

Tele ICU: Remote ICU Monitoring

<https://youtu.be/EZb6SPagCFo>

Remote Shoulder Scanning & Examination

https://youtu.be/xxYy_b8NAiY

Tele-ultrasonography for Kidneys

https://youtu.be/_H_gVVYvNHc

Remote Orthopaedic Range of Movement Testing

https://youtu.be/1zgig_TUg0g