eHEALTH and mHealth for Chronic Disease Management
- Envisaging the Paradigm- The Unconventional Way
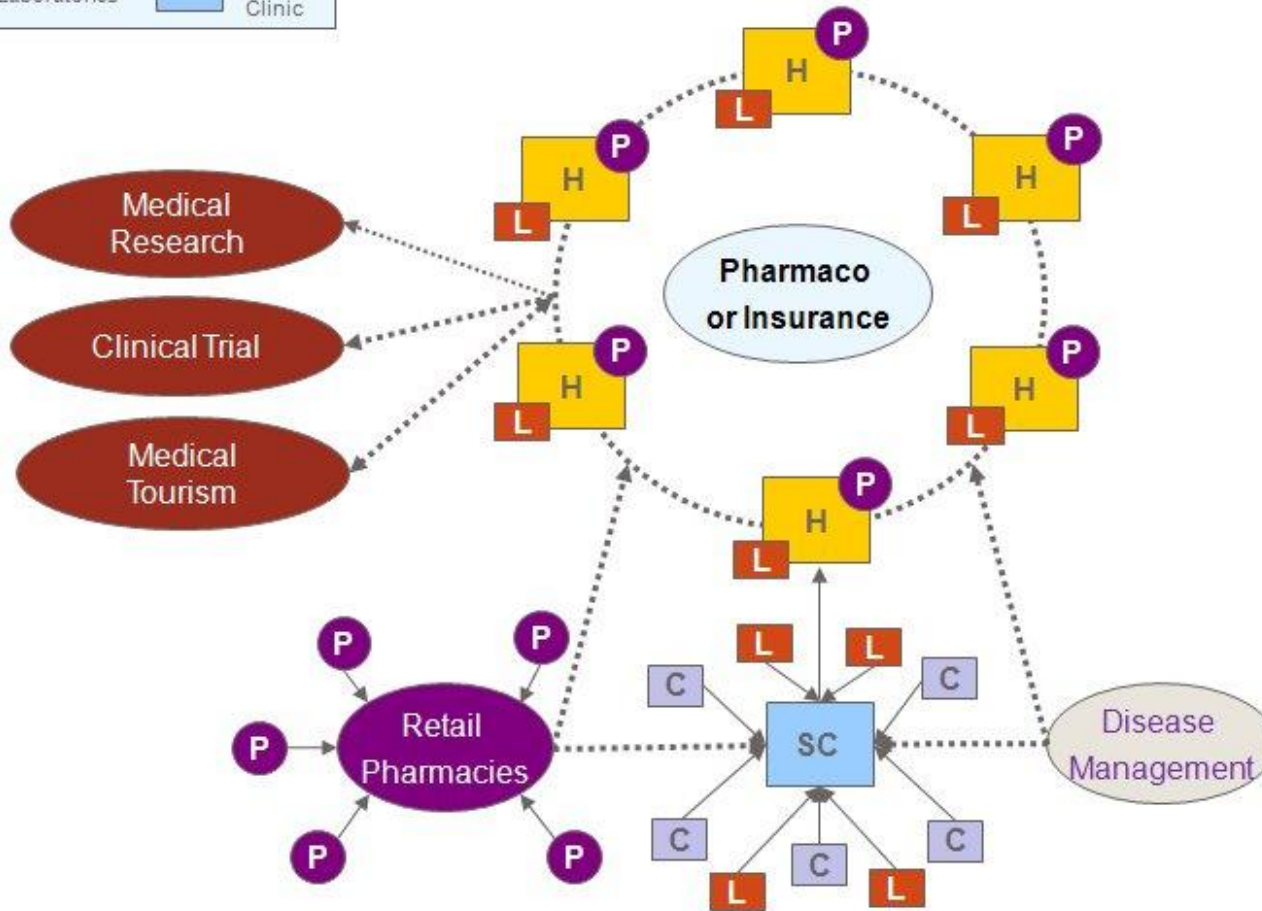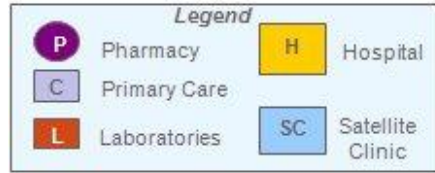
Presented at
HOSPIKON 2011, Pune
05th Feb 2011

Dr Pankaj Gupta
eHealth Business Executive

Emerging trends – Encounter based medicine is moving towards a Healthcare contract for disease management.

Legend
- P: Pharmacy
- C: Primary Care
- L: Laboratories
- H: Hospital
- SC: Satellite Clinic

ENCOUNTER BASED MEDICINE → PATIENT BASED MEDICINE → HC CONTRACT

Medical Research
Clinical Trial
Medical Tourism

Pharmaco or Insurance

Retail Pharmacies

Disease Management

Its in the interest of Pharmaco and Insurance to fund the Disease Management programs because only the Pharmaco and Insurance have the incentive to improve the health of the chronic disease patient.

Emerging Healthcare network in India
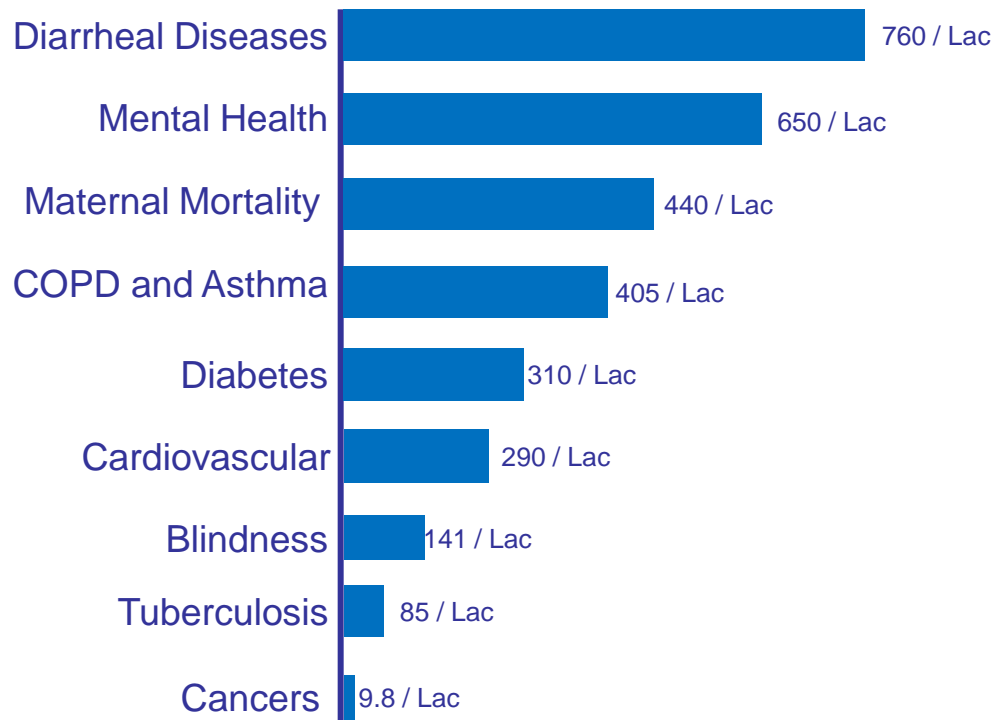
Disease Burden

- Dr Pankaj Gupta

Mental Health, COPD, Asthma, Diabetes and Cardiovascular disease remain the top non-communicable diseases important to Indians

Communicable diseases can be treated but non-communicable diseases remain for a life-time and need to be managed

Disease Burden Estimates 2005

Disease	Estimate
Diarrheal Diseases	760 / Lac
Mental Health	650 / Lac
Maternal Mortality	440 / Lac
COPD and Asthma	405 / Lac
Diabetes	310 / Lac
Cardiovascular	290 / Lac
Blindness	141 / Lac
Tuberculosis	85 / Lac
Cancers	9.8 / Lac

Key Findings

- Large proportion of urban India is very or somewhat concerned about the growing risk from non-communicable diseases.

  - Urban Indians are significantly more likely than rural Indians to suffer from non-communicable diseases

  - Rural India is more likely to suffer from communicable, maternal and peri-natal diseases

  - Estimates for the disease burden for **2015** show a significant jump in **Cardiovascular diseases** (640 cases/ Lac), **Mental Health** (800 cases/ Lac), **COPD** and **Asthma** (596 cases/ Lac) and **Diabetes** (460 cases/ Lac) while the top communicable diseases with the exception of diarrheal diseases are expected to show a significant drop.

Disease burden due to non-communicable diseases continue to be a major cause of morbidity in India

India's Most Ignored Health Problem: Cardiovascular Disease, COPD, Asthma and Diabetes

- India spends only 4.8% of its GDP on Healthcare

- People between the age group of 50-59 have the highest prevalence of Cardiovascular disease and Diabetes

- The estimated episodic cost of treating heart disease, diabetes, and asthma/COPD is Rs. 11,000, Rs. 5000, and between Rs. 20,000 - 32,000 respectively
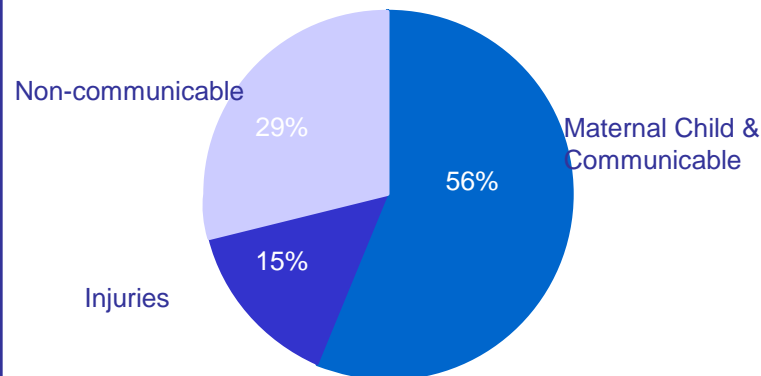
- With the government and external funding agencies focusing on communicable disease little or no attention is paid to the threat of communicable diseases.

- A Below Poverty Line [BPL] family study shows 333 days of wages lost due to a single episode of Heart disease; 100 days for Diabetes and between 650-900 for COPD and Asthma
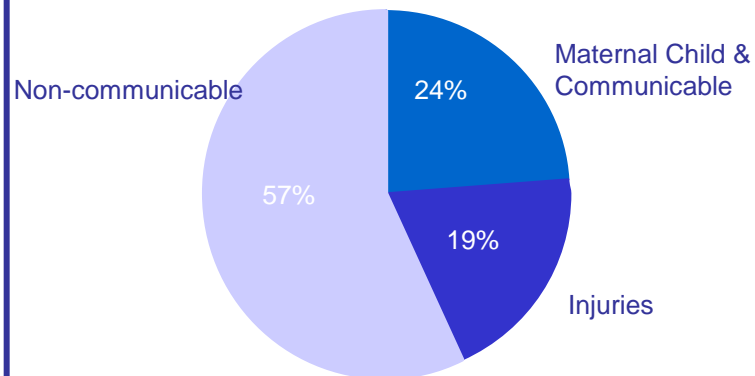
- Cardiovascular diseases are expected to increase by 120% through 2015

Source: Report of the National Commission on Macroeconomics and Health, Ministry of Health and Family Welfare, Government of India, 2005

Disease Burden 1990

- Maternal Child & Communicable 56%
- Non-communicable 29%
- Injuries 15%

Disease Burden 2020

- Maternal Child & Communicable 24%
- Non-communicable 57%
- Injuries 19%

Source: Chapter 2.8, 10th Five Year Plan, Planning Commission, Government of India

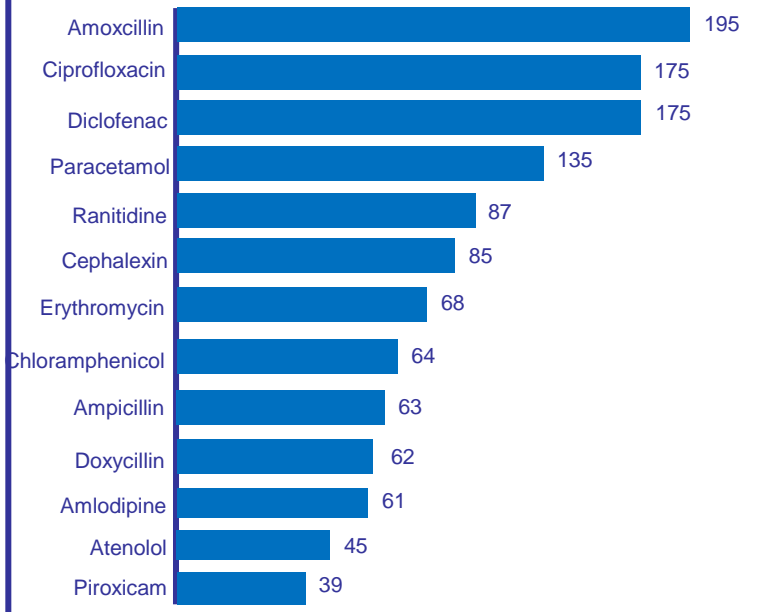# Antibiotics, Cardiac, CNS, Vitamins, NSAIDS and Respiratory are major pharmaceutical revenue generators

A Therapeutic View of the Most Important Diseases

Leading Therapeutic Classes - 2005	Sales (Bil.INR)	Market Size (%)	Therapeutic Area
Antibiotics	33	15.7	Anti-Microbial
Cardiac Therapy	10.2	6.9	CVD
CNS & Psychiatric Therapy	9.6	6.5	CNS
Vitamins	8.9	6.1	Anabolic
NSAIDS & Anti-Rheumatism	8.8	6.0	Anti-Inflammatory
Respiratory Ailments	7.8	5.3	Respiratory
Antacids & Anti-Ulcerants	6.2	4.3	Gastrointestinal
Anti Anemic	3.7	2.8	Anabolic
Anti Diabetic	3.7	2.7	Endocrine
Anti TB	3.6	2.5	Anti-Mycobacterium
Total	95.5	58.8	

Antibiotics are the major sales because of high incidence of Communicable diseases in India. However sales of cardiac, CNS and respiratory are the next big category of drug sales

India has process copyright but no IP protection, hence, multiple brands of same drug are often available

Drug	Value
Amoxcillin	195
Ciprofloxacin	175
Diclofenac	175
Paracetamol	135
Ranitidine	87
Cephalexin	85
Erythromycin	68
Chloramphenicol	64
Ampicillin	63
Doxycillin	62
Amlodipine	61
Atenolol	45
Piroxicam	39

Source: Developing Innovative Capacity in India to Meet Health Needs, Dr. HR Bhojwani, Advisor to Minister of State for Science and Technology, Government of India
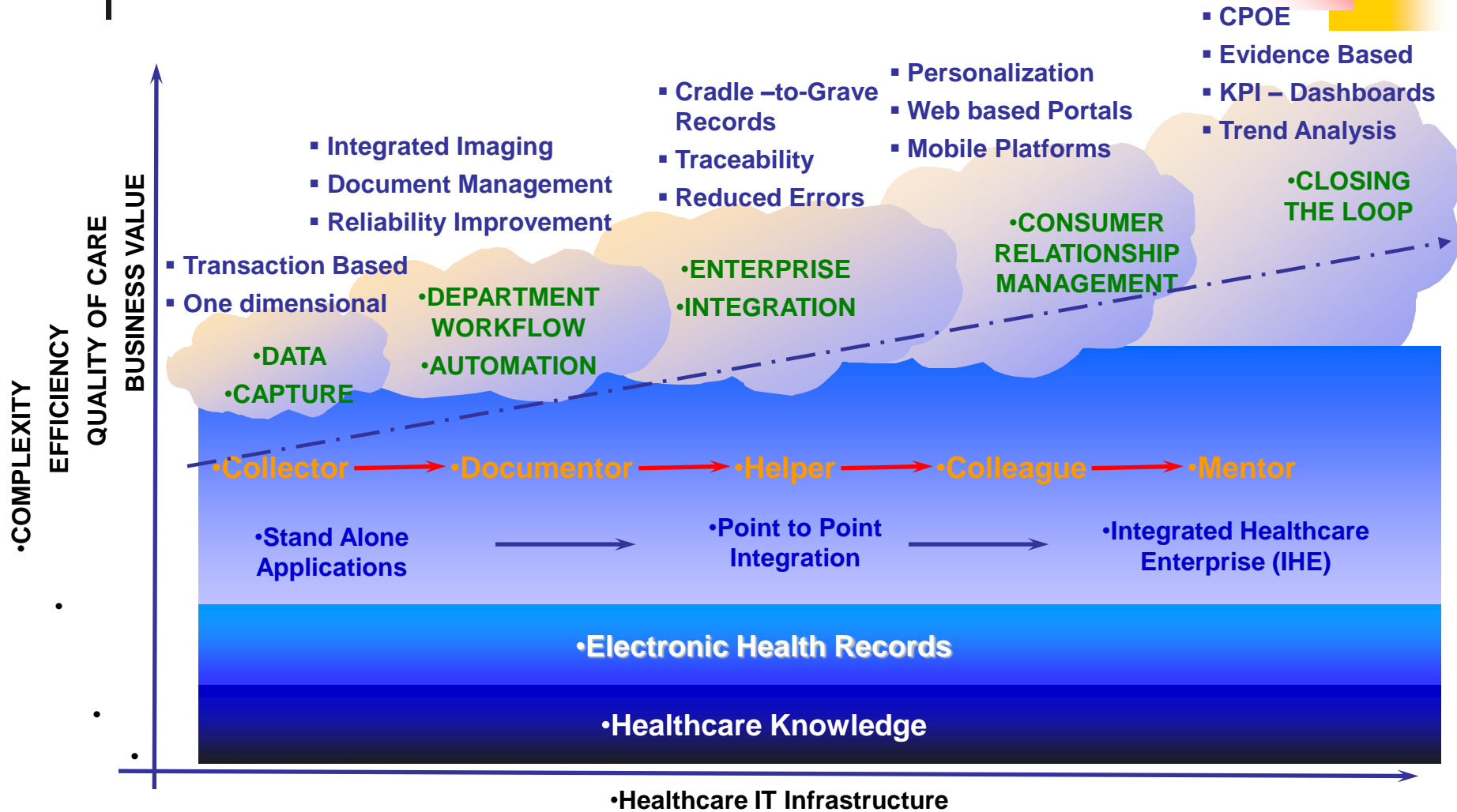
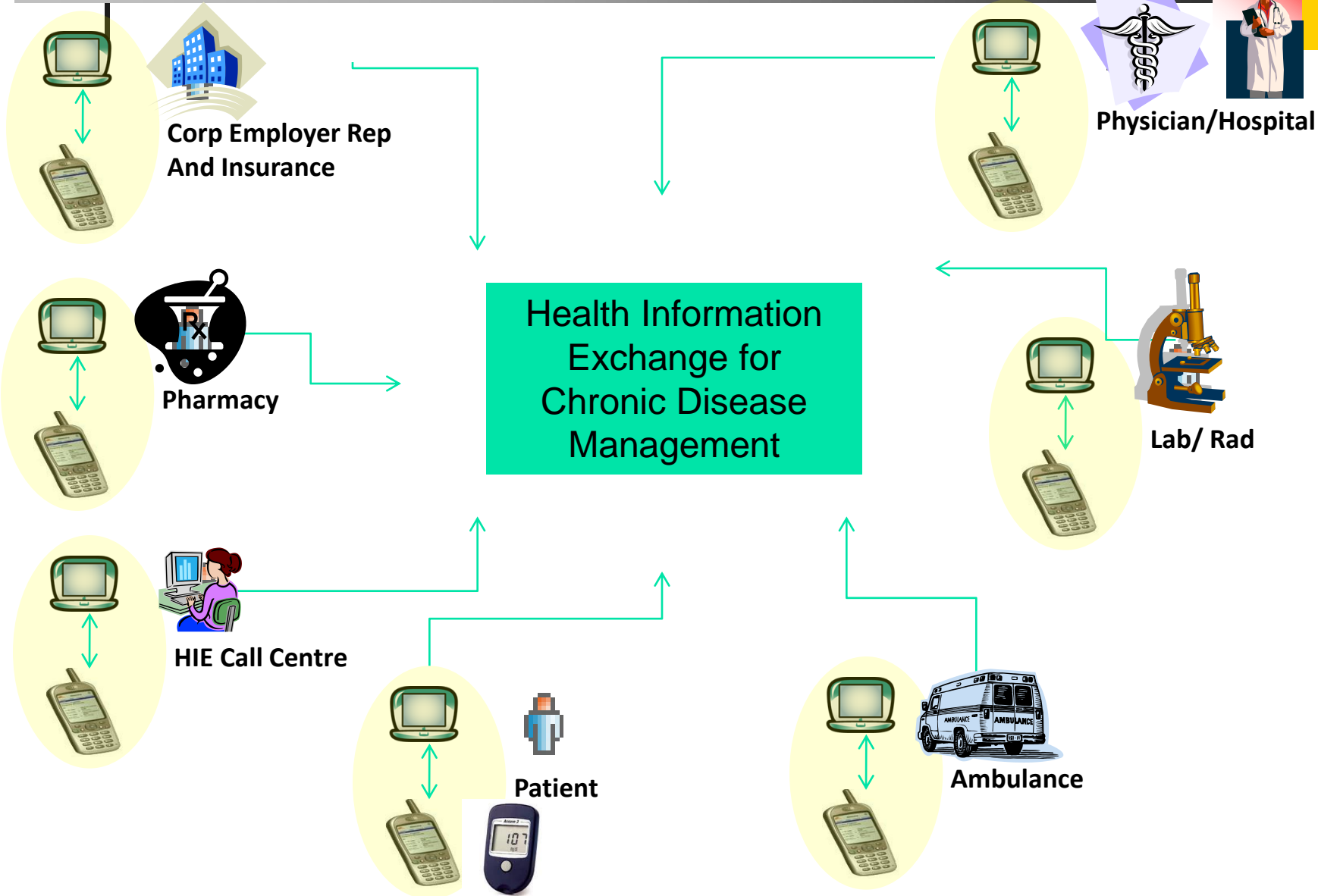# eHealth and mHealth Solutions

- Dr Pankaj Gupta

Health delivery has changed with time and so have electronic systems to support health delivery. However closing the loop remains a challenge..

Axis labels (left, bottom to top): COMPLEXITY · EFFICIENCY · QUALITY OF CARE · BUSINESS VALUE

Bottom axis: •Healthcare IT Infrastructure

- Transaction Based
- One dimensional
  - •DATA
  - •CAPTURE

- Integrated Imaging
- Document Management
- Reliability Improvement
  - •DEPARTMENT WORKFLOW
  - •AUTOMATION

- Cradle –to-Grave Records
- Traceability
- Reduced Errors
  - •ENTERPRISE
  - •INTEGRATION

- Personalization
- Web based Portals
- Mobile Platforms
  - •CONSUMER RELATIONSHIP MANAGEMENT

- CPOE
- Evidence Based
- KPI – Dashboards
- Trend Analysis
  - •CLOSING THE LOOP

•Collector → •Documentor → •Helper → •Colleague → •Mentor

- •Stand Alone Applications
- •Point to Point Integration
- •Integrated Healthcare Enterprise (IHE)

•Electronic Health Records

•Healthcare Knowledge

Convincing all the stake holders to share the data on a cloud is the biggest challenge in building a health information exchange

Corp Employer Rep And Insurance

Physician/Hospital

Pharmacy

Lab/ Rad

Health Information Exchange for Chronic Disease Management

HIE Call Centre

Patient

Ambulance

Presenting a conceptual system for Disease management through mobile platforms

	Call-in	Call-in	Call-out	Call-in	Call-out	Call-out	Call-in/Out
	IVR	Call Centre	Call Centre	SMS/MMS	SMS/MMS	Voice Mail	Mobile Modem
Lab Reminder			Y		Y	Y	
Lab Report Upload	Y	Y	Y		Y	Y	Y
Physician Appointment Reminder			Y		Y	Y	
Medical Record Upload		Y	Y				Y
Medicine Dose Reminder			Y		Y	Y	
Medicine Refill Reminder			Y		Y	Y	
Refill Confirmation Upload	Y	Y	Y	Y#	Y#		Y
Diet Reminders			Y*		Y	Y	
Exercise Reminder			Y*		Y	Y	
Home Monitor Reminder			Y*		Y	Y	
Upoad Home Monitor Data - integrated				Y			Y
Upoad Home Monitor Data - manual	Y	Y	Y	Y#	Y#		
Disease Education material	Y				Y	Y	Y

Call-in	When a patient, clinician or pharmacist calls into the DM system
Call-out	When the DM systems calls out to the patient, clinician or pharmacist
Y*	Call centre can't call too often else the patient will feel overwhelmed.
Y#	Call-out and Call-in combo for SMS
Mobile Modem	System at the point of use is connected to the central repository through mobile modem

Health information exchange [HIE] is required to integrate healthcare entities and enable chronic disease management [CDM]
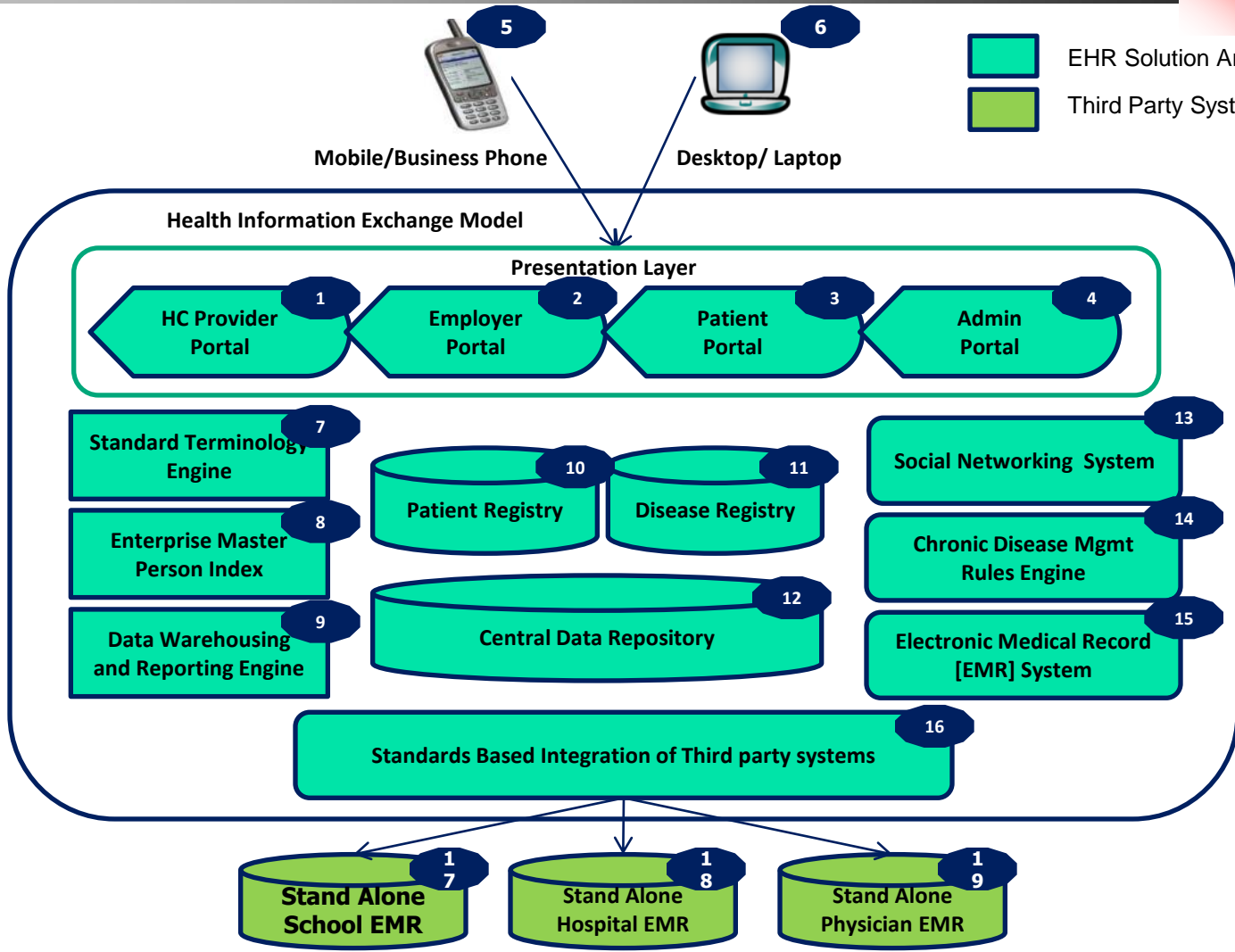
Solution Architecture of an Electronic Health Record System [EHRs] from a functional perspective

Behavior Change Challenges

- Dr Pankaj Gupta

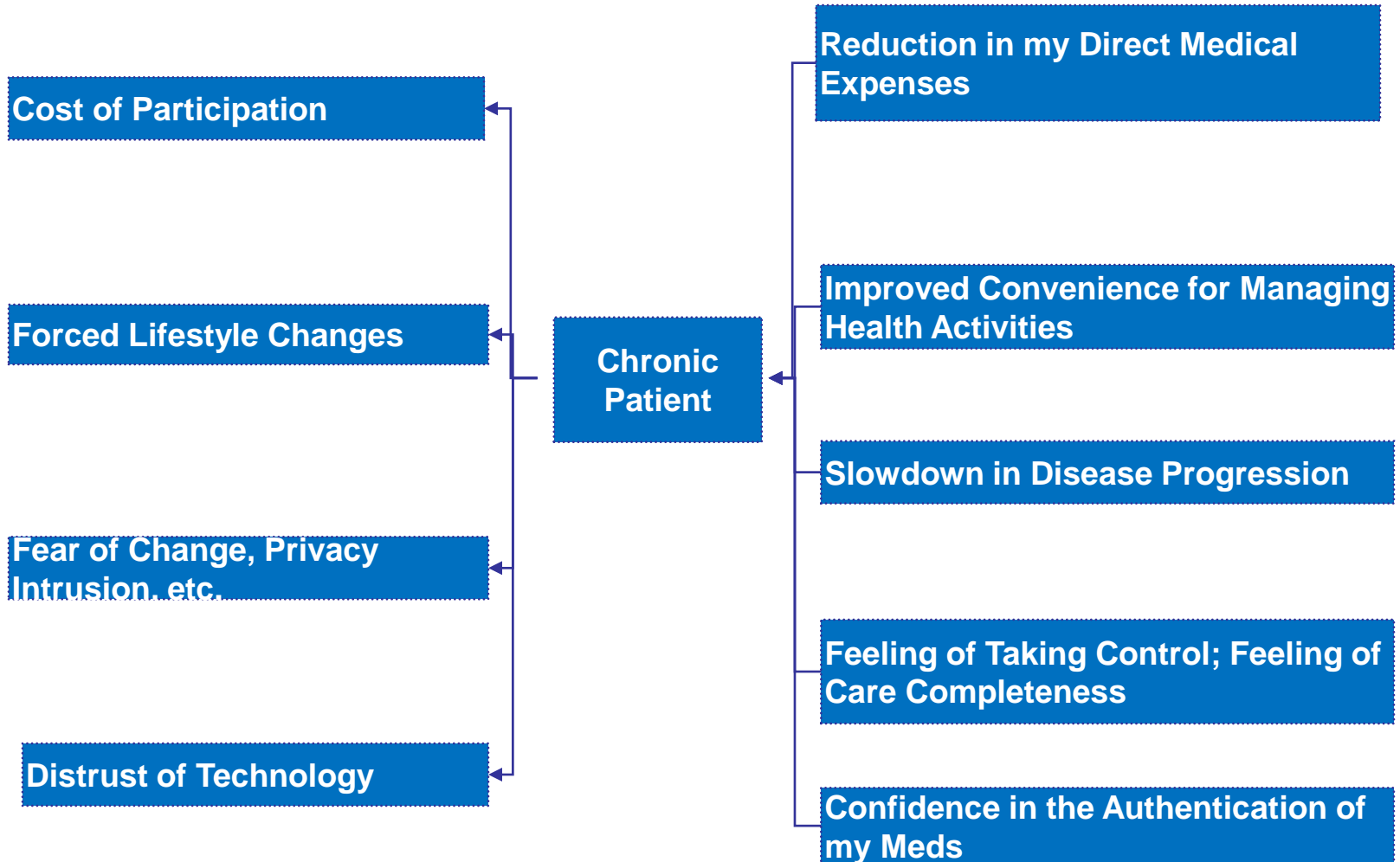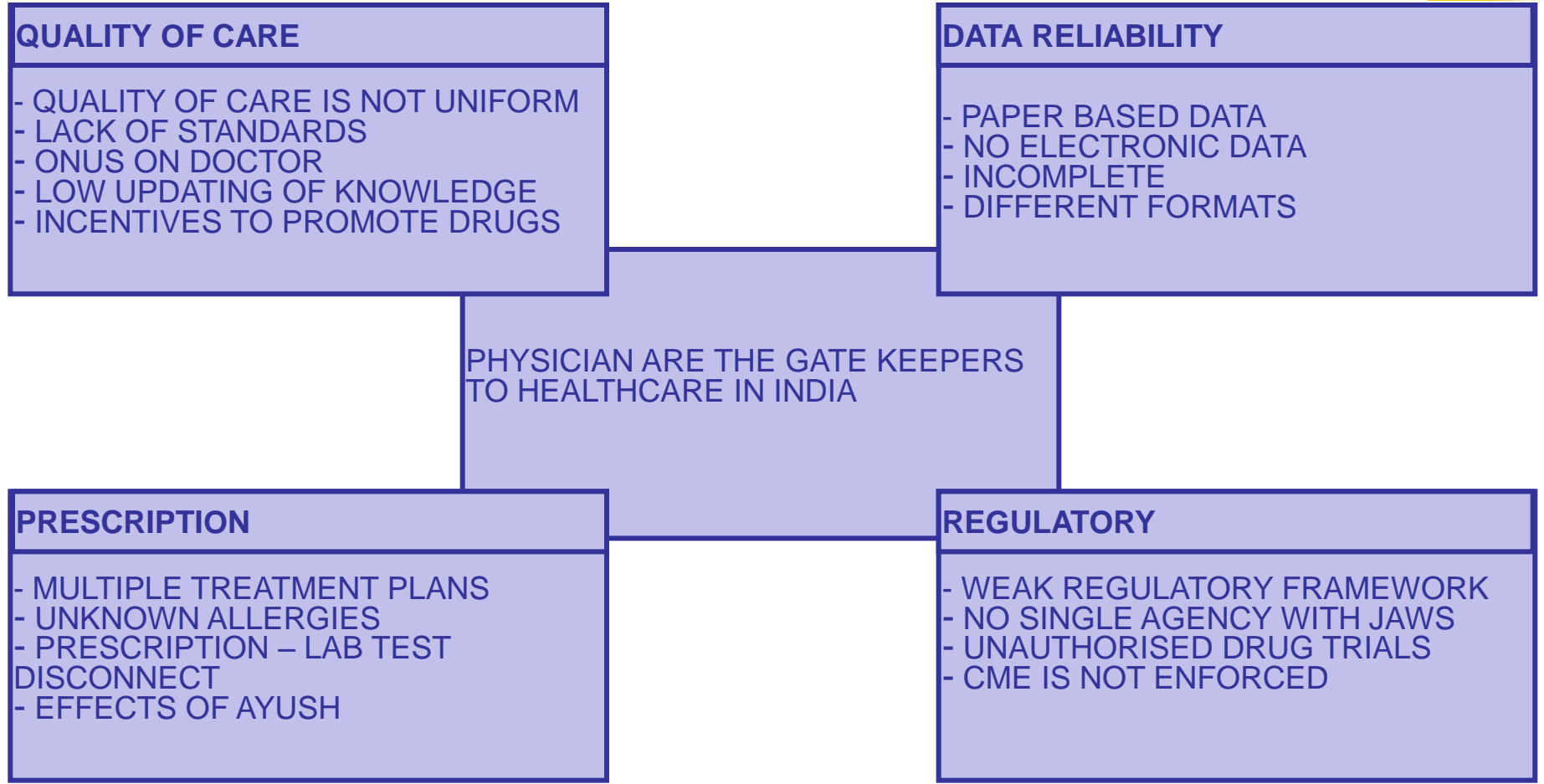# The Chronic Patient perspective - fears over the benefits

Detractors

Key Benefits

Cost of Participation

Forced Lifestyle Changes

Fear of Change, Privacy Intrusion, etc.

Distrust of Technology

Chronic Patient

Reduction in my Direct Medical Expenses

Improved Convenience for Managing Health Activities

Slowdown in Disease Progression

Feeling of Taking Control; Feeling of Care Completeness

Confidence in the Authentication of my Meds

Physicians are the HC Gate Keepers, but there is evidence to suggest that they are ill-equipped to deliver consistent Quality of Care [QoC]

QUALITY OF CARE

- QUALITY OF CARE IS NOT UNIFORM
- LACK OF STANDARDS
- ONUS ON DOCTOR
- LOW UPDATING OF KNOWLEDGE
- INCENTIVES TO PROMOTE DRUGS

DATA RELIABILITY

- PAPER BASED DATA
- NO ELECTRONIC DATA
- INCOMPLETE
- DIFFERENT FORMATS

PHYSICIAN ARE THE GATE KEEPERS TO HEALTHCARE IN INDIA

PRESCRIPTION

- MULTIPLE TREATMENT PLANS
- UNKNOWN ALLERGIES
- PRESCRIPTION – LAB TEST DISCONNECT
- EFFECTS OF AYUSH

REGULATORY

- WEAK REGULATORY FRAMEWORK
- NO SINGLE AGENCY WITH JAWS
- UNAUTHORISED DRUG TRIALS
- CME IS NOT ENFORCED

Today, in India, Patients tend to lack any real influence over their QoC

PHYSICIAN SWITCHING

- DOCTOR – PATIENT FACE TIME
- PATIENT WANT HUMAN TOUCH
- PATIENTS NEED INSTANT RELIEF
- MULTIPLE PHYSICIANS
- MULTIPLE TREATMENT PLANS

MEDICATION HABITS

- APATHY TOWARDS MEDICATION
- ALTERNATIVE MEDICINE
- SELF MEDICATION
- SELF DESCISION MAKING

PATIENTS ARE AT RECEIVING END FOR HEALTHCARE IN INDIA

REGULATION

- CONSUMER PROTECTION ACT
- DRUG PROMOTION TO PATIENTS

COST

- OUT-PATIENT IS OUT-OF-POCKET
- DESIRE FEELING OF WELL BEING
- DON'T WANT TO PAY EXTRA

Behavior change occurs in small steps and requires constant reinforcement to result in healthier behavior

A

- Mini-Mart
- Black-Berry
- Bus Ads
- HABIT
- Art of Living
- Wine Clubs

B

- Coupon
- Brand
- REWARDS
- Loyalty Prog.

C

- Army
- Team
- FEAR
- Work

COMPLIANCE

TIME

Habit Fear Reward
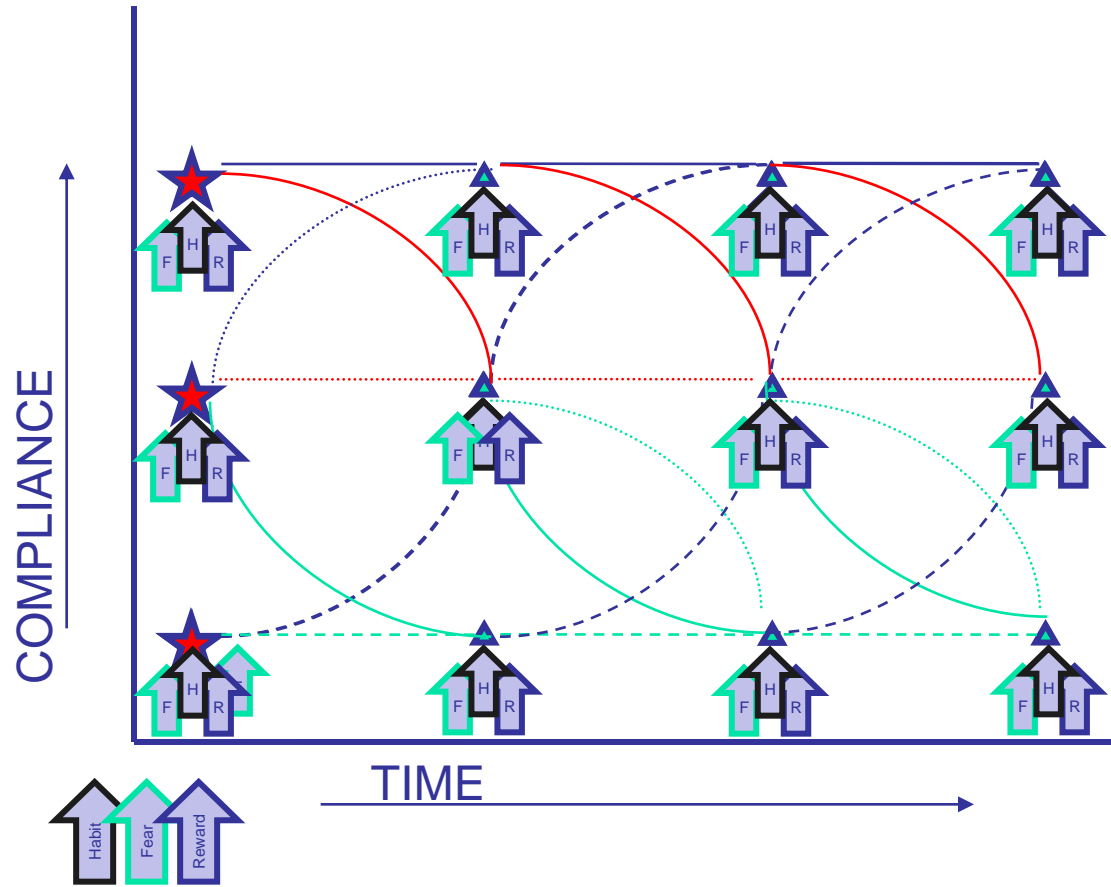
Personalization and convenience are key factors in behavioral modification cases - a blend of high tech and "high touch" is the most effective

No single communication channel will be effective for all individuals. Some demographic groups can't (or won't) access the Internet, others lack phone service, and still others prefer to receive services directly from employees at local insurance offices rather than use self-service kiosks.

Evaluate communication channel options in terms of four criteria: sensitivity of data, need for timeliness, consumer preference and consumer access to technology. The biggest challenge for payers is learning about consumer preferences. Payers have limited knowledge of their members and must invest in market research to understand communication preferences, along with other attributes, to design effective communication programs.

Technology investments must include advanced analytics to draw insight into patient behavior and clinical requirements beyond predictive modeling and gaps in care to take advantage of disease management, psychosocial and other personal attributes.

Payers should adopt a patient-centric, physician-involved proactive care management strategy. Payers should invest in integrated technology that increases analytic capabilities and automates rules that drive a shared workflow that leads to multi-channel communication.

Err on the side of simplicity. Nearly everyone has a telephone, but not all consumers have access to the Internet (or wish to use it). Don't get swept away by the wonders of new technology.
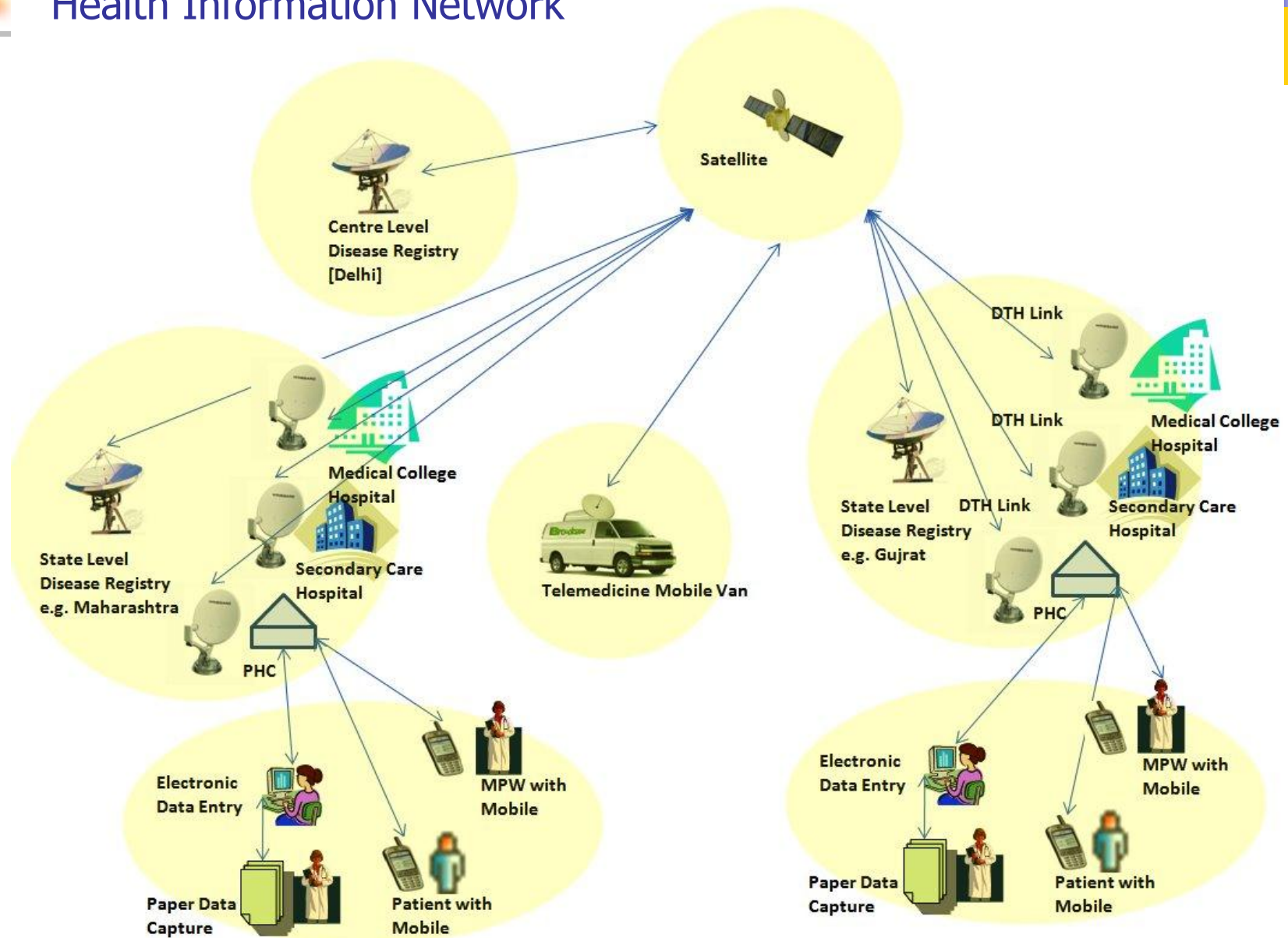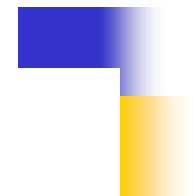
Disease Registries and National Health Information Network

- Dr Pankaj Gupta

Government has to play a major role in providing the IT infrastructure for National Disease Registry and National Health Information Network
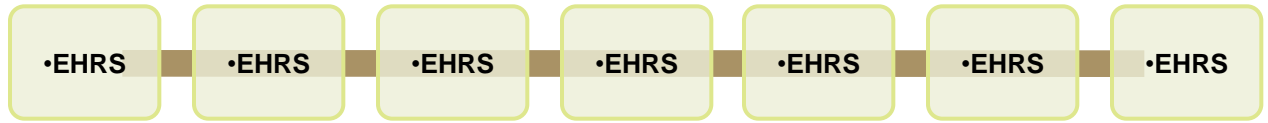
Best Practices from
Canada Health Infoway,
USA EMR and Meaningful Use

- Dr Pankaj Gupta

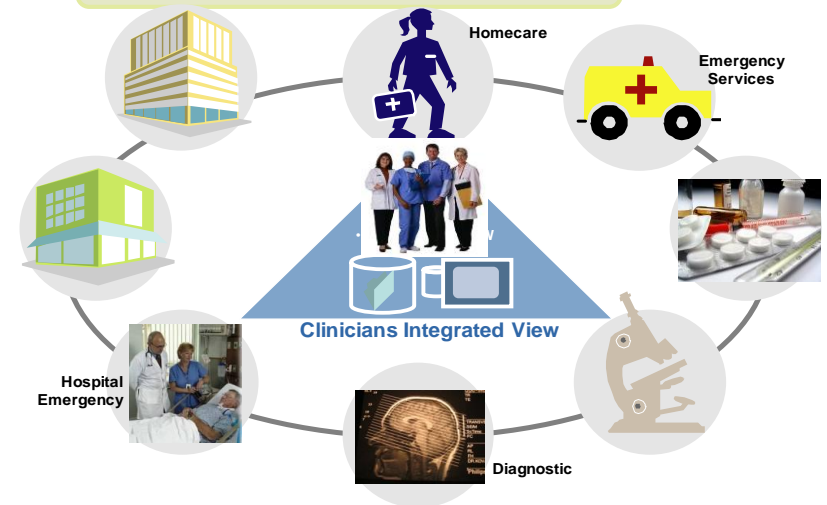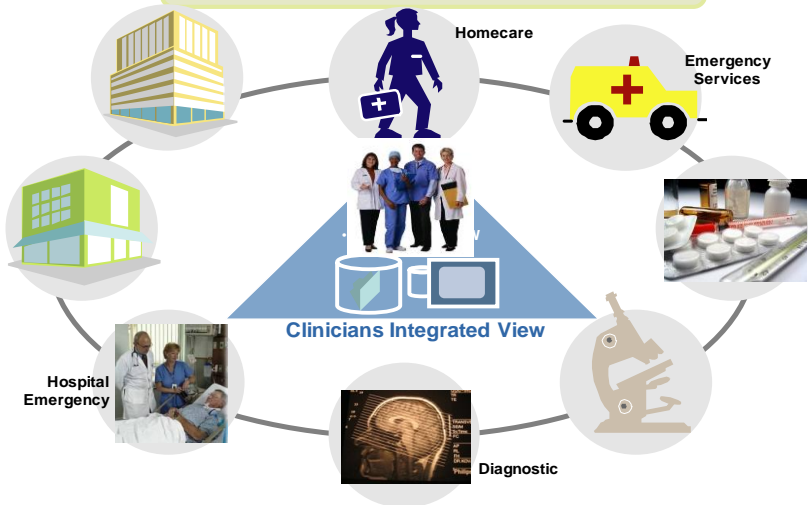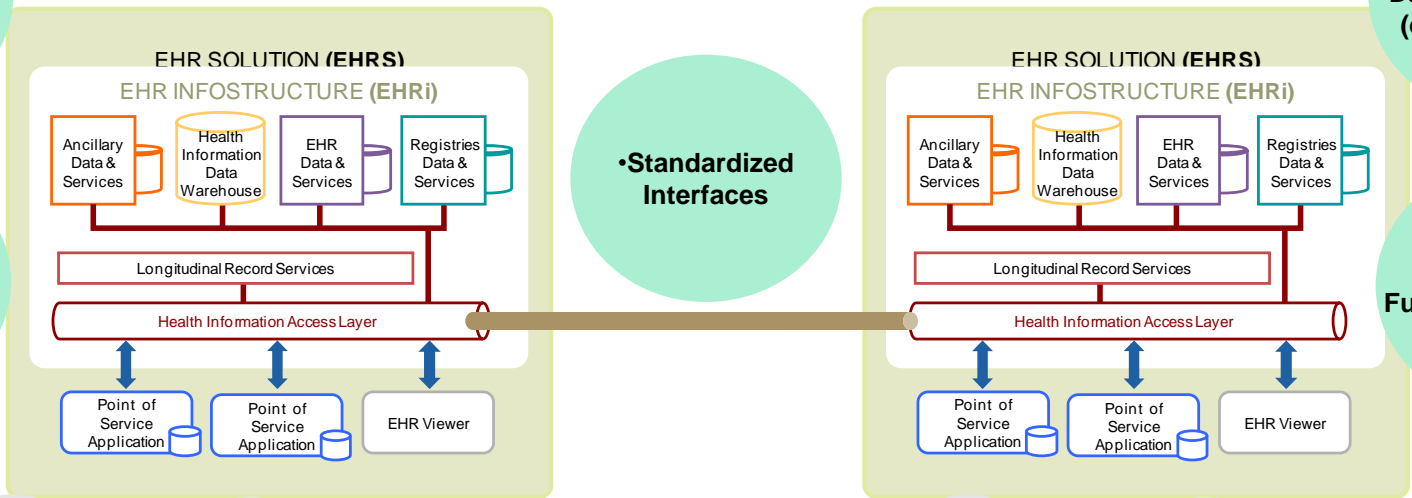# Chronic Disease Management on an Integrated network

THANKS!

Dr_PankajGupta@yahoo.com
LinkedIn:http://www.linkedin.com/in/drpankajgupta
Blog:http://www.healthcareitstrategy.blogspot.com/