



KNOWLEDGEABLE
SERVICE ROBOTS
FOR AGING

Workshop on ICT and Robotics for Care and Service

An advanced care system

Hamburg December 2012

Dr. Hadas Lewy

Maccabi Healthcare Services

Maccabi Healthcare Services

- Second largest and fastest growing HMO in Israel (25% of Market)
- Non-profit mutual
- Recognized health fund - Israeli National Health Insurance Law
- Provides public basket of services
- Offers voluntary supplementary insurance
- Supplies services via own facilities and outside providers



*Our
Office*

Maccabi Statistics

1.95 M members



9000 Employees



5000 physicians
(85% private)



700 Pharmacies



5 Districts , 140 Branches



13 Hospitals- Assuta



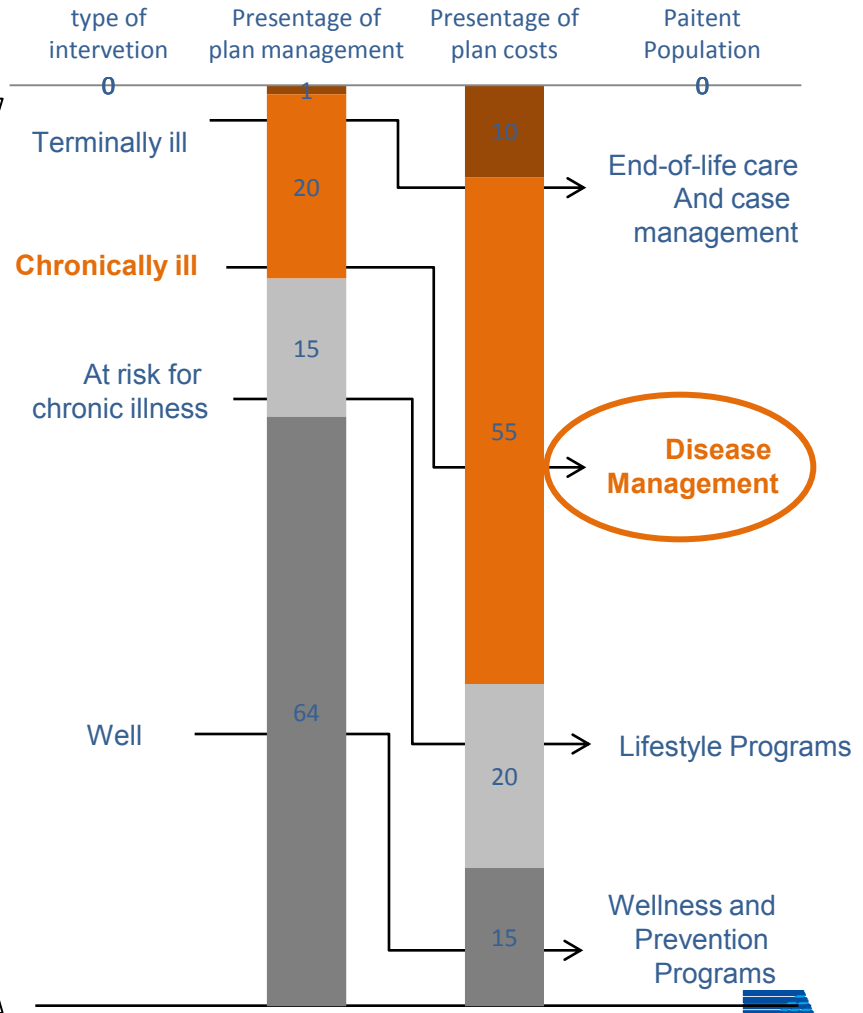
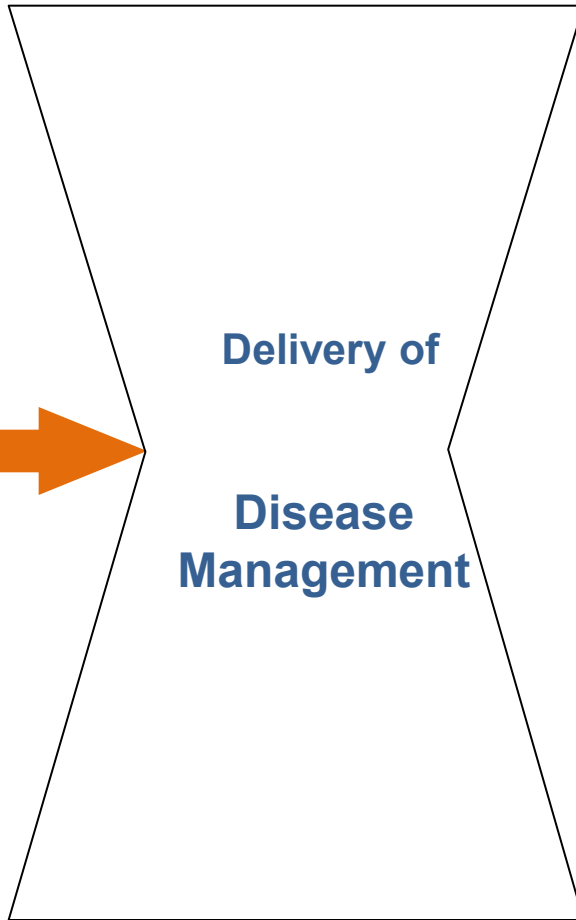
Budget : 1.8 billion €

Why Telemedicine?

- Equal access all over the country
- On-Line diagnosis and treatment
- Extension of service hours.
- Reliable diagnosis due to digital tools
- Standardization of care and Quality control and assurance.
- Sharing information among physicians for treatment and consultation
- Sharing Information with the patient and patient empowerment.
- More efficient use of resources

Chronic Diseases

- Aging population with an increase of life-expectancy
- Chronic diseases proliferation
- Shortage of medical professional personnel
- Substantial expense for chronic patients

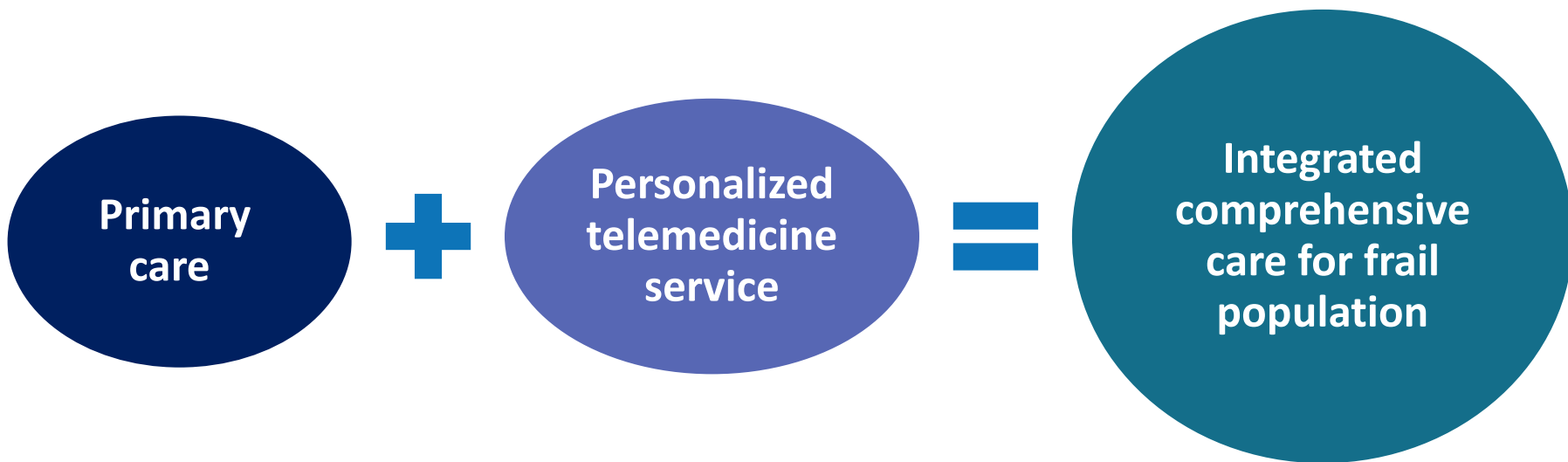


Chronic Diseases

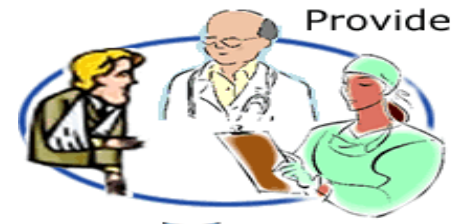
The Challenges

- Increased national health care spending
- Average visit duration of primary care physician- 5-7 min
- Variation in quality of treatment
- Poor patient compliance
- Availability, accessibility and equity problems
- Frequent hospital readmissions and unnecessary ER visits
- Fragmented delivery system – ineffective
- Shortage of health care professionals

Our vision



Healthcare Provider Visit and Provider Based EHR



Videoconference



KSERA- Advance care system

The main aim is to develop a socially assistive mobile robot that helps elderly people with their daily activities, care needs and disease self-management.

- On-Line diagnosis and treatment plans
- High quality treatment
- Motivate the patient, Increase patient compliance
- Address availability, accessibility and equality problems
- Proactive and personalized- improve patient's condition
- Addresses social needs- A Major factor in health
- Early detection, alerts, intervention, recommendations and prevention of deterioration



- **Standardization of care and Quality control and assurance.**
- **Sharing information among physicians for treatment and consultation**
- **Sharing Information with the patient leading to patient empowerment.**
- **More efficient use of resources**
- **Advanced technological platform for disease management**





Alerts 4 new alerts ▾

 Display all alerts

		Name	Phone	Relative name & phone	Physician name & phone	Alert Type	Next scheduled task
▶	●	Ronen Chen	056-987-98760	Emanuelle Shor 056-987-98760	Dr. Avraham Lavy 056-987-98760	08/01/2012 BP 180/90	10/01/2012 Check HR
▶	●	Yuval Ben	056-987-98760	Moshe Sharvit 056-987-98760	Dr. Shiri Chen 056-987-98760	08/01/2011 Weight 99	10/01/2012 Check O2 saturation
▶	●	Ruti Mizrahi	056-987-98760	Suzana Mizrahi 056-987-98760	Dr. Ayala Dror 056-987-98760	08/01/2011 BP 180/90	10/01/2012 Check HR
▶	●	Rivka Grinberg	056-987-98760	Shahar Grinberg 056-987-98760	Dr. Efrat Versano 056-987-98760	08/01/2011 BP 220/75	10/01/2012 Check HR

My Tasks 50 patients found, Filtered by: scheduled items for Date [Change filter criteria ▾](#)

		Name ▾	Phone	Relative name & phone	Physician name & phone	Last activity	Next scheduled task
▶	●	Menachem Shulman	056-987-98760	Moshe Shulman 056-987-98760	Dr. Avraham Lavy 056-987-98760	05/01/2012 No Transmission	10/01/2012 Check clinical parameters
▶	●	David Choen	056-987-98760	Rinat Levi 056-987-98760	Dr. Rochama Nir 056-987-98760	08/01/2012 Weight 99	10/01/2012 Check physical activity
▶	●	Shulamit Ganor	056-987-98760	Shai Ganor 056-987-98760	Dr. Shiri Chen 056-987-98760	08/01/2012 BP 180/90	10/01/2012 Check HR
▶	●	Bat-Sheva Finkelstein	056-987-98760	Mery Finkelstein 056-987-98760	Dr. Nir Sason 056-987-98760	08/01/2012 HR 48	10/01/2012 Check O2 saturation
▶	●	Shmulik Weiss	056-987-98760	Adi Weiss 056-987-98760	Dr. Ayala Dror 056-987-98760	08/01/2012 BP 180/90	10/01/2012 Check physical activity
▶	●	Nurit Siman - Tov	056-987-98760	Rona Bar-Haim 056-987-98760	Dr. David Mandelbum 056-987-98760	08/01/2012 O2 92%	10/01/2012 Check O2 saturation
▶	●	Joachim Teub	056-987-98760	Codi Teub	Dr. Aris Sheam	08/01/2012	10/01/2012



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- SUN
- MON
- TUE
- WED
- THU
- FRI
- SAT

O2 saturation

Blood Pressure

HR

[Finalize](#) [To Patient Record](#)

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Menchem Shulman

Age: 77 Male

Phone: (200) 954 7865

[Update](#)

Disease follow-up - Parkinson

Other Chronic disease: CHF, Diabetes

[Update](#)

Last 7 days state



[Finalize task](#)

[Patient Details](#)
[Schedulaer & treatment plan](#)
[Measurements](#)
[Call history](#)
[Questionnaire](#)

[Load Protokol](#)

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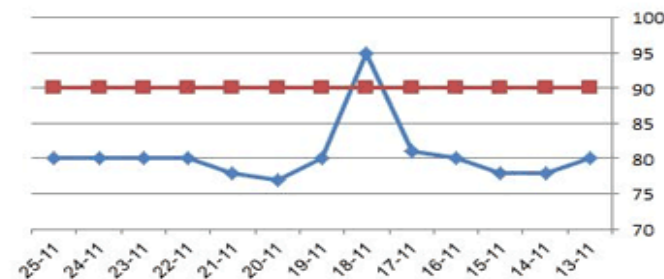
▼ Rate

 Last 10 measurements

 From date

to date

Date and Time	Data	Info
19/12/2011 13:00	210 BPM	Alert
19/12/2011 13:00	250 BPM	Alert



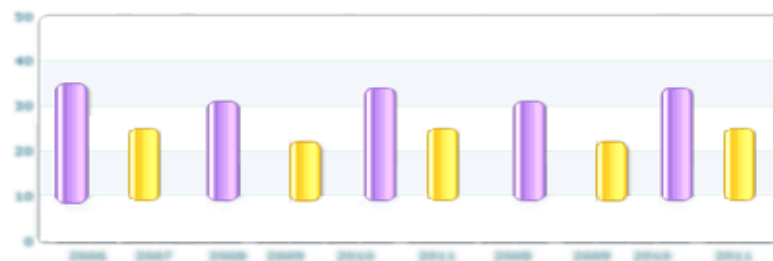
▼ Blood Pressure

 Last 10 measurements

 From date

to date

Date and Time	Data	Info
19/12/2011 13:00	120/80 mmHg	Alert
19/12/2011 13:00	120/80 mmHg	Alert



▶ Weight

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**Menchem Shulman**

Age: 77 Male

Phone: (200) 954 7865

[Update](#)**Disease follow-up - Parkinson**

Other Chronic disease: CHF, Diabetes

[Update](#)**Last 7 days state**[Finalize task](#)

Patient Details

Scheduler & treatment plan

Measurements

Call history

Questionnaire

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Print Page

Medical History[Update](#)**Lab tests** (Urea 40mg/cl, cr 1.0, Hb 14gr%)**Hospitalization** (4.12.2011 COPD exacerbation, pneumonia)

▼ **Medications:** (Ipratropium inhalation 1X2 day, Prednisone 10mgX1 day)
- 01/01/11 012.5mgX10 days

Consultations (Pulmonology Dr RAZ, dermatologist Dr OR)▶ **Last visit** (GP Dr Mishpacha)**Radiology** (4.12.11 chest X-ray Maccabi Hashalom)**Allergies** (penicillin)**Treatment Plan**[Update](#) **Blood Pressure:** every day, morning **Saturat on:** every day, night **Weigl t:** every d , morning **Follow up call :** every 7 days; Monday **Physical Activity follow up:** every 10 days**Contacts**[Update](#)

Relation	Name	Cell Phone	Home Phone
Spouse	Mrs. Rita Smith	(811) 512 123123	(811) 512 123123
Physician	Dr. Shultz		(811) 512 123123
Son	Mr. Noam Smith	(811) 512 123654	(811) 512 654873
Sister	Mrs. Shoshana Levi	(811) 654 124 578	(811) 654 124 578

Last Measurements

Date and Time	Type	Data	Info
19/12/2011 13:00	Blood Pressure	120/80 mmHg	Alert
19/12/2011 13:00	Blood Pressure	120/80 mmHg	Alert

Load Protokol

Print Page



Menchem Shulman

Age: 77 Male
Phone: (200) 954 7865

[Update](#)

Disease follow-up - Parkinson

Other Chronic disease: CHF, Diabetes

[Update](#)

Last 7 days state



[Finalize task](#)

Patient Details

Schedulaer & treatment plan

Measurements

History

Questionnaire

[Load Protokol](#)

[Print Page](#)

Current Questionnaire

- 1. How do you feel today? 1 2 3 4 5 6 7 8 9 10
- 2. Morbi tellus nibh, fermentum at venenatis sit ? 1 2 3 4 5 6 7 8 9 10
- 3. In posuere mauris ut velit eleifend nec? Yes No
- 4. How do you feel today? 1 2 3 4 5 6 7 8 9 10
- 5. Morbi tellus nibh, fermentum at venenatis sit ? 1 2 3 4 5 6 7 8 9 10
- 6. In posuere mauris ut velit eleifend nec? 1 2 3 4 5 6 7 8 9 10
- 7. How do you feel today? Yes No Free Text:
- 8. Morbi tellus nibh, fermentum at venenatis sit ? 1 2 3 4 5 6 7 8 9 10
- 9. In posuere mauris ut velit eleifend nec? 1 2 3 4 5 6 7 8 9 10
- 10. How do you feel today? 1 2 3 4 5 6 7 8 9 10

Your Score: 80

Archive Questionnaire

▶ 20/01/2012

▼ 10/01/2012

- 1. How do you feel today? 1 2 3 4 5 6 7 8 9 10
- 2. Morbi tellus nibh, fermentum at venenatis sit ? 1 2 3 4 5 6 7 8 9 10
- 3. In posuere mauris ut velit eleifend nec? 1 2 3 4 5 6 7 8 9 10
- 4. How do you feel today? 1 2 3 4 5 6 7 8 9 10
- 5. Morbi tellus nibh, fermentum at venenatis sit ? 1 2 3 4 5 6 7 8 9 10
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- 7. How do you feel today? 1 2 3 4 5 6 7 8 9 10
- 8. Morbi tellus nibh, fermentum at venenatis sit ? 1 2 3 4 5 6 7 8 9 10
- 9. In posuere mauris ut velit eleifend nec? 1 2 3 4 5 6 7 8 9 10
- 10. How do you feel today? 1 2 3 4 5 6 7 8 9 10

Your Score: 60%

▶ 30/12/2011

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Schedulaer



Your Nurse is:
Shina Turner

[+ Add New Task](#)
[Today](#)
[Daily](#)
[Weekly](#)
[Monthly](#)
20-26 November

Wednesday- 23/11

November 2011

Su	Mo	Tu	We	Th	Fr	Sat
5	4	3	2	1	30	31
12	11	10	9	8	7	6
19	18	17	16	15	14	13
26	25	24	23	22	21	20
3	2	1	30	29	28	27

Treatment Plan

- Blood Pressure:** every day, morning
- Saturation:** every day, night
- Weight:** every day, morning
- Follow up call:** every 7 days; Monday
- Physical Activity follow**

	Sunday 20	Monday 21	Tuesday 22	Wednesday 23	Thursday 24	Friday 25	Saturday 26
09:00							
09:15							
09:30							
09:45							
10:00							
10:15							
10:30		Runing 3 time a week		Doctor appoitment			
10:45				<div style="border: 1px solid gray; padding: 5px;"> <input checked="" type="checkbox"/> Complete task <input type="checkbox"/> Delete </div>			
11:00							
11:15						Follow up call <input checked="" type="checkbox"/>	
11:30							
11:45							
12:00							
12:15							
12:30							
12:45							

Legend: ■ Exercise | ■ FollowUp | ■ Doctor Appointment



Clinical protocols

- Assistive tool for the Healthcare provider
- Provide guidelines and decision support tool for the HC professional in his daily work
- Serve as the basis for interaction between the Healthcare professional and the patient
- Enable providing standardized service
- Enable tracking treatment problems\actions

**Mr Moshe Goldberg**Age: 65 M
Phone: +972355543425[Update](#)**Disease follow-up - COPD**Other Chronic disease: **Diabetes Hypertension**[Update](#)**Last 7 days state**[Finalize task](#)[Patient Details](#)[Scheduler & Treatment plan](#)[Measurements](#)[History](#)[Questionnaire](#)[Load Protocol](#)[Print](#)**Beta Blockers**[Change protocol](#)**!** Ask the patient to measure his/her blood pressure.Patient's Systolic Blood Pressure is: mmHg**!** Ask the patient to measure his/her pulse.Patient's Pulse is: bpm**?** Is the patient presenting any of the following symptoms?Patient's Heart Rate is less than 44 bpm. Yes No Patient's Blood Pressure is less than 90mmHg, AND complaining of a known beta-blocker adverse reaction. Yes No **?** Ask the patient for any of the following symptoms:

- Systolic Blood Pressure is below 90mmHg.
- Heart rate is between 44-50.
- Patient is not in the drug's target dose.
- Patient lacks essential information of the drug (dose,target, method of use, adverse effects)
- Patient has changed the drug's dose in the previous 2 weeks and is suffering from a known adverse

Notes:

[< Previous](#)**The Following Steps****Question: Systolic Blood Pressure****?** Was there a change in the drug's dose in the previous two weeks?**Instruction: Heart rate is between****→** Return to the previous known**Instruction: Patient is not in the****→** Instruct the patient to continue**Instruction: Patient lacks essential information of the drug (dose,target, method of use)****→** Inform the patient of the guide with b-Blockers.**Instruction: Patient experienced familiar with the drug.****→** Instruct the patient to continue**Instruction: Patient's Systolic Blood Pressure dropped over 40mmHg following drug's dose in the previous 2 weeks**[Already Answered](#)[Map Protocol](#)

Key Principles

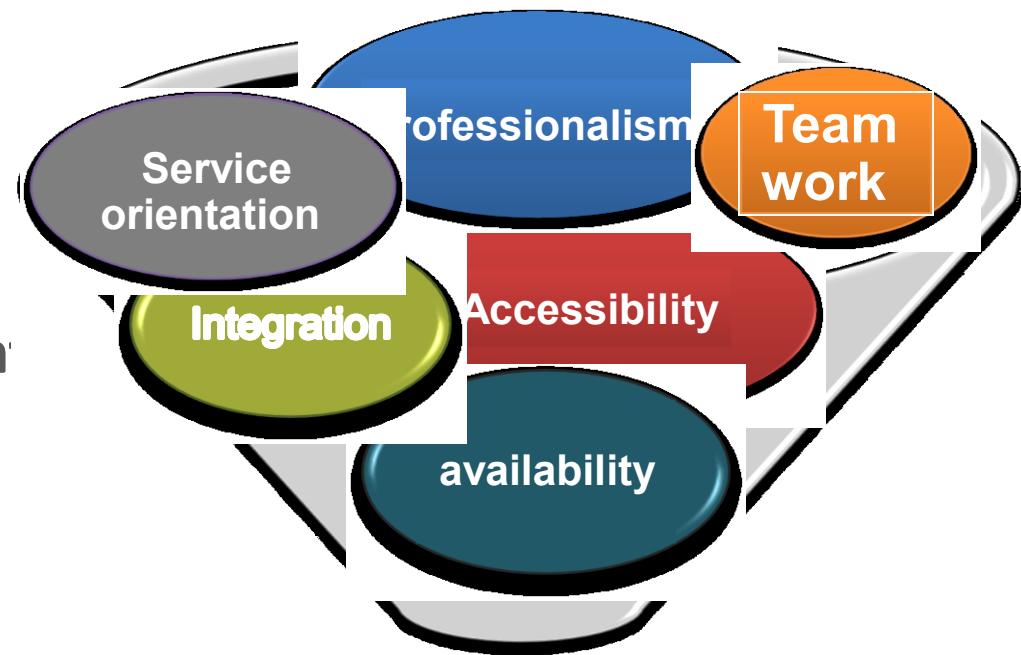
- Dedicated proactive professional care
- Availability and accessibility 24/7
- Coordinated & integrated with community network
- Prevention of deterioration
- Improve physical and mental condition
- Standardized high quality professional care
- Enhanced patient compliance
- Advanced technology platforms

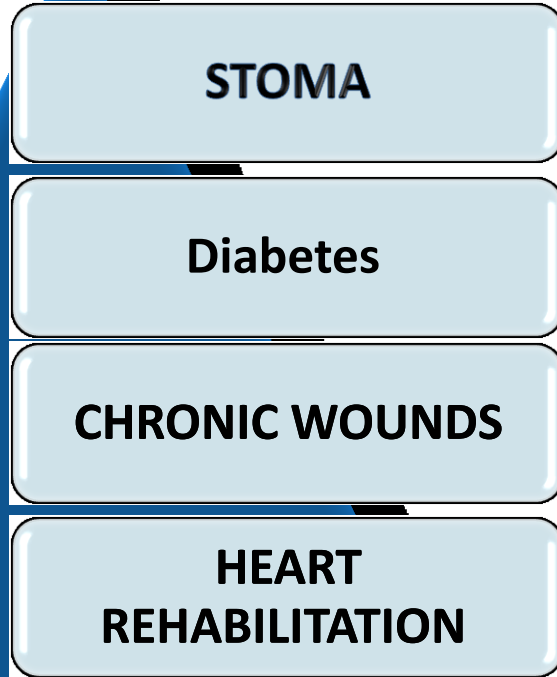


Thank You

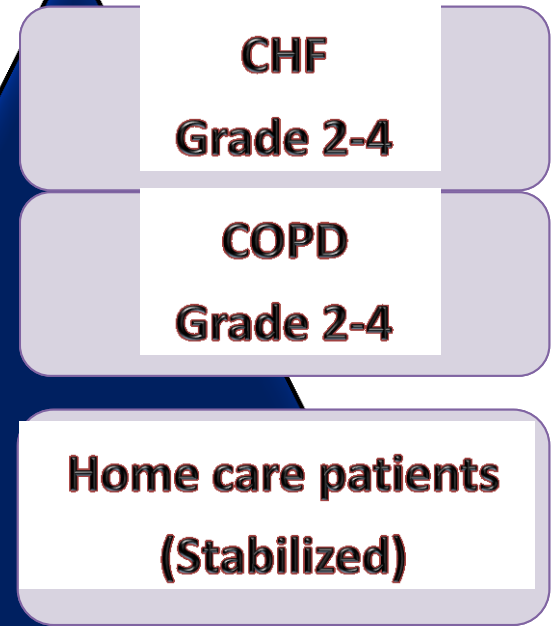
Success measures

- Functional capacity
- Depression
- Compliance
- QOL
- Satisfaction- carer and patient
- Readmission

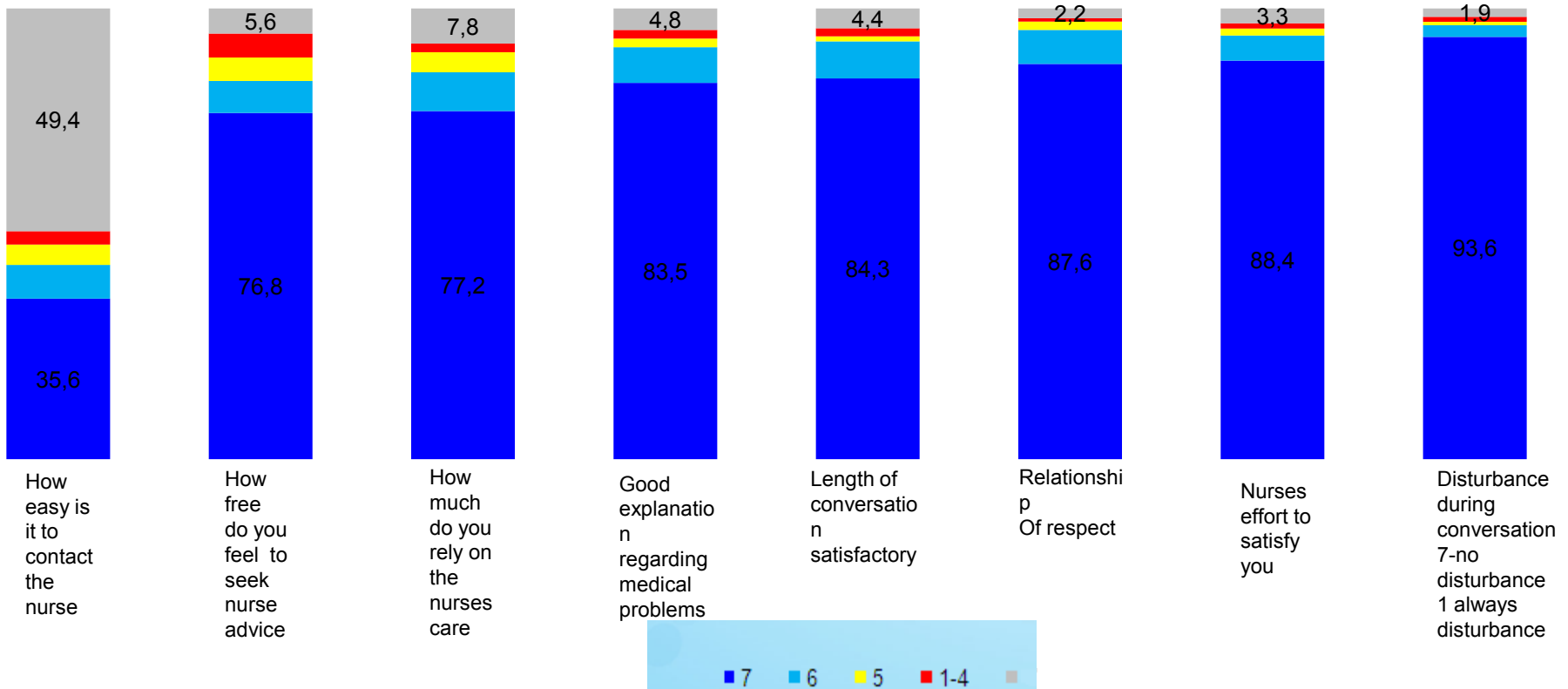




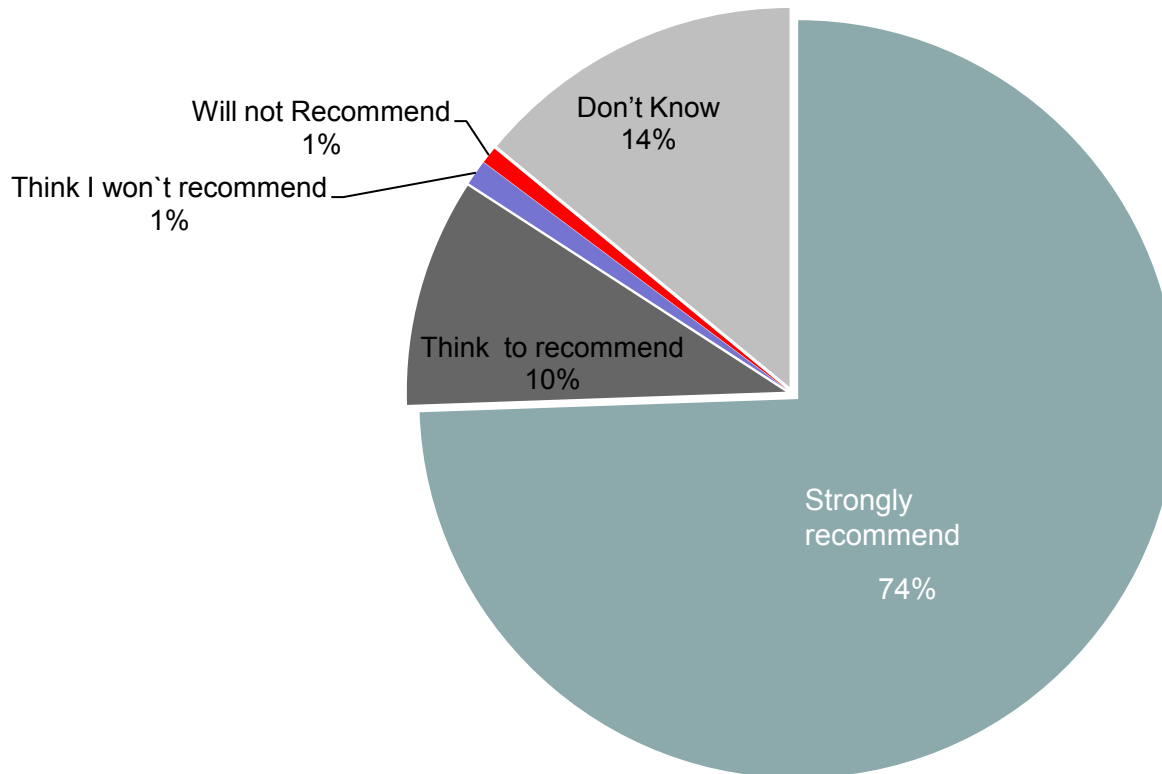
Stabilized patients
4000



Frail complex patients
6000



Recommendation to Others to Join the CHF Program



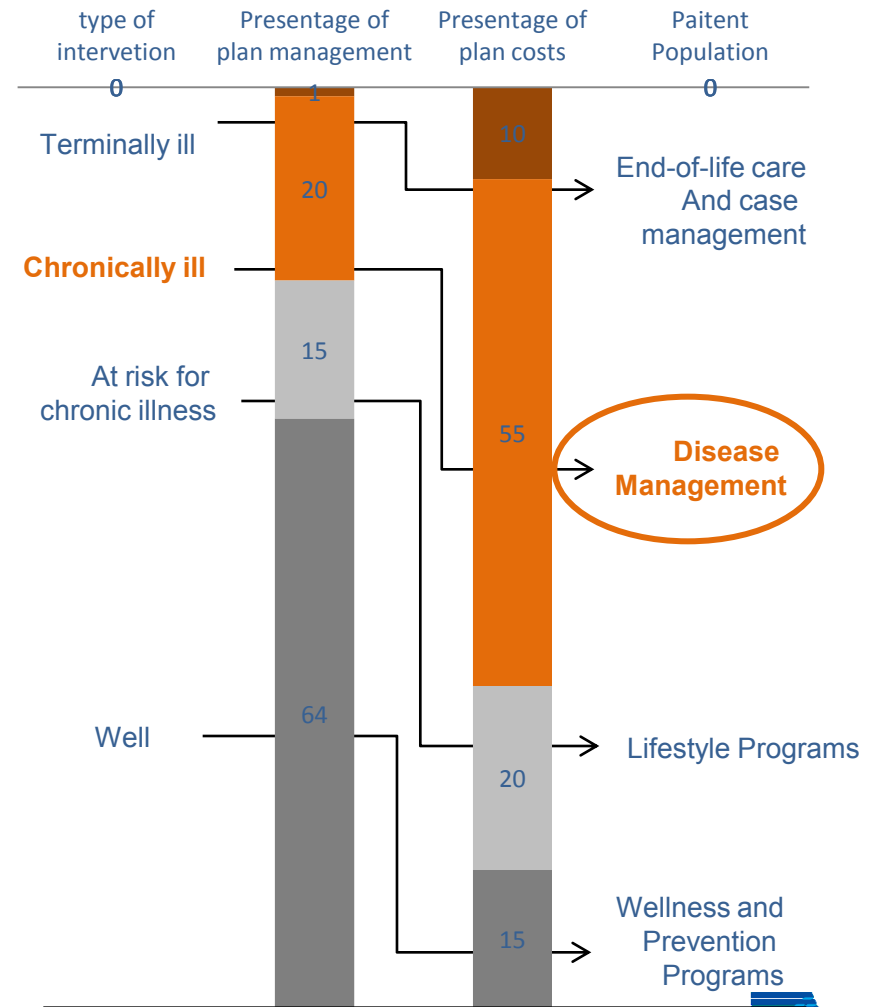
- Every transaction with the patient is computerized
- Every provider uses the Maccabi Electronic Medical Record
- Maccabi EMR includes the whole patient record
- E-Laboratory
- E- Prescription
- E- Consultation
- Telemedicine
- Alerts and Reminders
- Physician Portal on web and mobile
- Patient Website also on mobile

Chronic disease conditions and costs

Key Insights

- The World Health Organization (WHO) estimates that chronic diseases make up 60% of the global disease burden, which is expected to rise to 80% by the year 2020
- Americans with chronic conditions account for 75% of total healthcare costs, of which the chronically ill account for 55% of healthcare costs
- In 2010, over **one-third of Europe's population** is estimated to have developed at least one chronic disease populations, with a significant increase in the number of people with multiple chronic diseases.

Key findings



Existing Medical Services

Tele -Diagnosis

- Teleradiology
- Tele- ECG/Holter
- Tele-mammography : mobile truck
- Tele- Ophthalmology
- Tele – Skin ulcers

Tele Treatment/ Consultation

- Video Conference –care giver -patient
- Video Conference- home care
- Video Conference- Service Station

Center

- Multidisciplinary center
- Maccabi Pharm
- Nurses call center
- Smoking Cessation
- Interpreter Services

Information Access

- Web Site
- PHR
- Cellular