Telemedicine for Reducing 30-day Readmission Rates Following Acute Myocardial Infarction

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Conflict of interest

- I have no conflict of interest

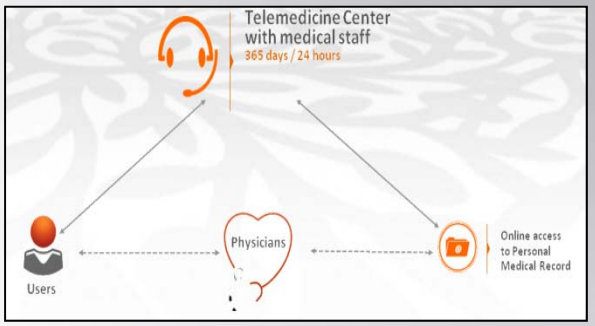
Background - *readmissions*

- Patients hospitalized for an **AMI** are frequently at **risk for early readmission**
  - Reported readmission rates in the community reach **~20%**
  - Many readmissions are unrelated to the index AMI

- **Comorbid conditions** play a central role in readmission

- 30-day readmission rates have become a **quality-of-care marker**

Background - *telemedicine*



- Telemedicine offers **real-time biometrics tracking** and is a promising strategy for improving clinical outcome

- Telemonitoring was demonstrated as being **useful in** the management of **heart failure patients**
  - Reduced mortality and readmission rates

- Telemonitoring for reducing **post-AMI** readmission rates **has not been studied** to date

Objective

- **To assess the 30-day readmission rate of post-AMI ‘SHL-Telemedicine’ members**

Methods

- Files of SHL-Telemedicine subscribers
  - Hospitalized for AMI between 2009-2012
  - Became members of ‘SHL’ within 5±4 days from discharge

- Retrospectively analyze for demographics, coronary risk factors, reasons for readmission, and discharge diagnoses

Results

- A total of **897 patients** were included
  - Mean age 62±14 years
  - 81% males
- Telemedicine services used:
  - 3,318 calls to the monitor center
  - A mobile ICU dispatched for 158 patients
  - 68/158 patients transported to hospital
- **Only 52 (5.8%) patients were re-admitted**
  - 10 patients were admitted twice
  - Total number of 62 readmissions

Results: **Baseline characteristics**

Characteristic	Non-readmitted (n=845)	Readmitted (n=52)	p - Value
Age, year (mean ± SD)	61±11.6	59±13.2	0.266
Female sex, n (%)	150 (17.8)	16 (30.8)	0.026
Past medical history			
Hypertension, n (%)	406 (48.1)	23 (44.2)	0.669
Diabetes, n (%)	161 (19.1)	11 (21.2)	0.717
Hyperlipidemia, n (%)	459 (54.3)	33 (63.4)	0.251
Previous MI, n (%)	59 (6.9)	8 (15.4)	0.033
Previous revascularizations, n (%)	85 (10.1)	10 (19.2)	0.058
Ejection fraction % (mean ± SD)	47±9.5	43±11.8	0.047
Chronic renal failure, n (%)	33 (3.9)	3 (5.7)	0.651

Results: **Acute MI hospitalization**

(Cont'd)	Non-readmitted (n=845)	Readmitted (n=52)	p Value
Index hospitalization characteristic			
Admission length, days (Mean ± SD)	5.06±1.7	5.12±1.7	0.078
STEMI, n (%)	459 (69.2)	29 (66.1)	0.522
Resuscitation during admission, n (%)	38 (4.5)	3 (5.7)	0.727
Percutaneous coronary intervention, n (%)	565 (66.8)	32 (61.5)	0.277
CABG during admission, n (%)	29 (3.4)	1 (1.9)	0.720

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Results: **Presenting symptoms at readmission**

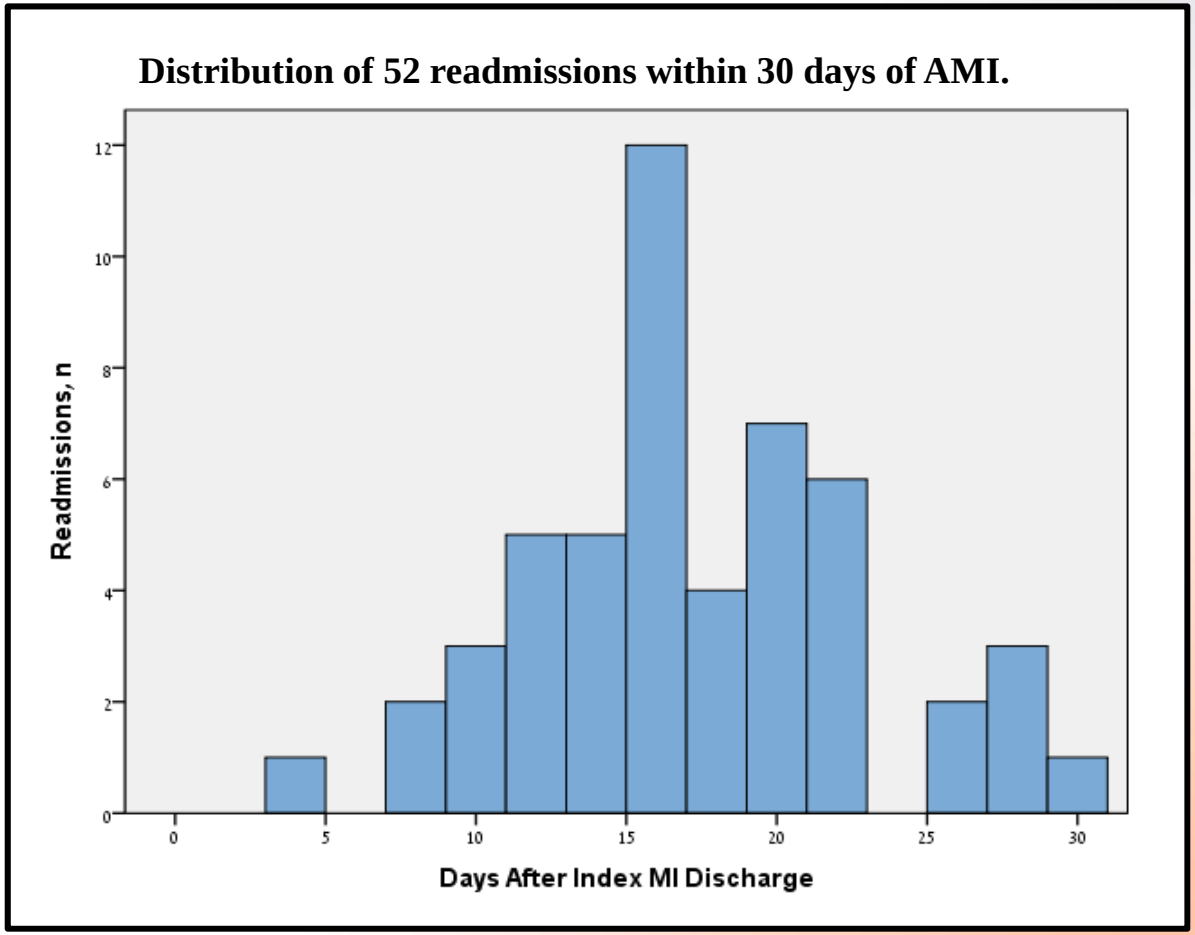
Complaint	Number of patients (%)
Chest pain	30 (57.7)
Shortness of breath	7 (13.5)
Weakness	4 (7.7)
“Not feeling well”	4 (7.7)
Palpitations	4 (7.7)
Headache	1 (1.9)
Back pain	1 (1.9)
Slurred speech	1 (1.9)

Results: **Reasons for readmission**

Diagnosis at discharge	Number of patients (%)
Cardiac	**17 (32.7)**
Acute coronary syndrome	12 (23.1)
Congestive heart failure	2 (3.8)
Atrial fibrillation	2 (3.8)
Tamponade	1 (1.9)
Non-Cardiac	**35 (67.3)**
Non-specific chest pain	26 (50.0)
Non-specific complaints	5 (9.6)
Hypertension	1 (1.9)
CVA	1 (1.9)
COPD exacerbation	2 (3.8)

Results: **Timing of readmissions**

- Mean days from discharge to readmission = 17± 6



Results: **Factors associated with readmission**

- Readmission rates were higher
  - **Previous MI** (11.9% vs. 5.3%, p=0.033)
  - **Female gender** (9.6% vs. 4.9%, p=0.026)
  - **Previous revascularizations** (10.5% vs. 5.2%, p=0.058)
- Readmitted patients
  - Lower EF (43% vs. 47%, p=0.047)
  - More oral nitrates (7.7% vs. 1.5%, p=0.014)
- There were no significant differences associated with DM, hypertension or CHF

Conclusions

- **Implementation of telemedicine technology can reduce 30-day readmission rates in patients post-AMI**

- This reduction
  - Is not influenced by co-morbidities
  - Is found in both cardiac and non-cardiac admissions

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Thank you

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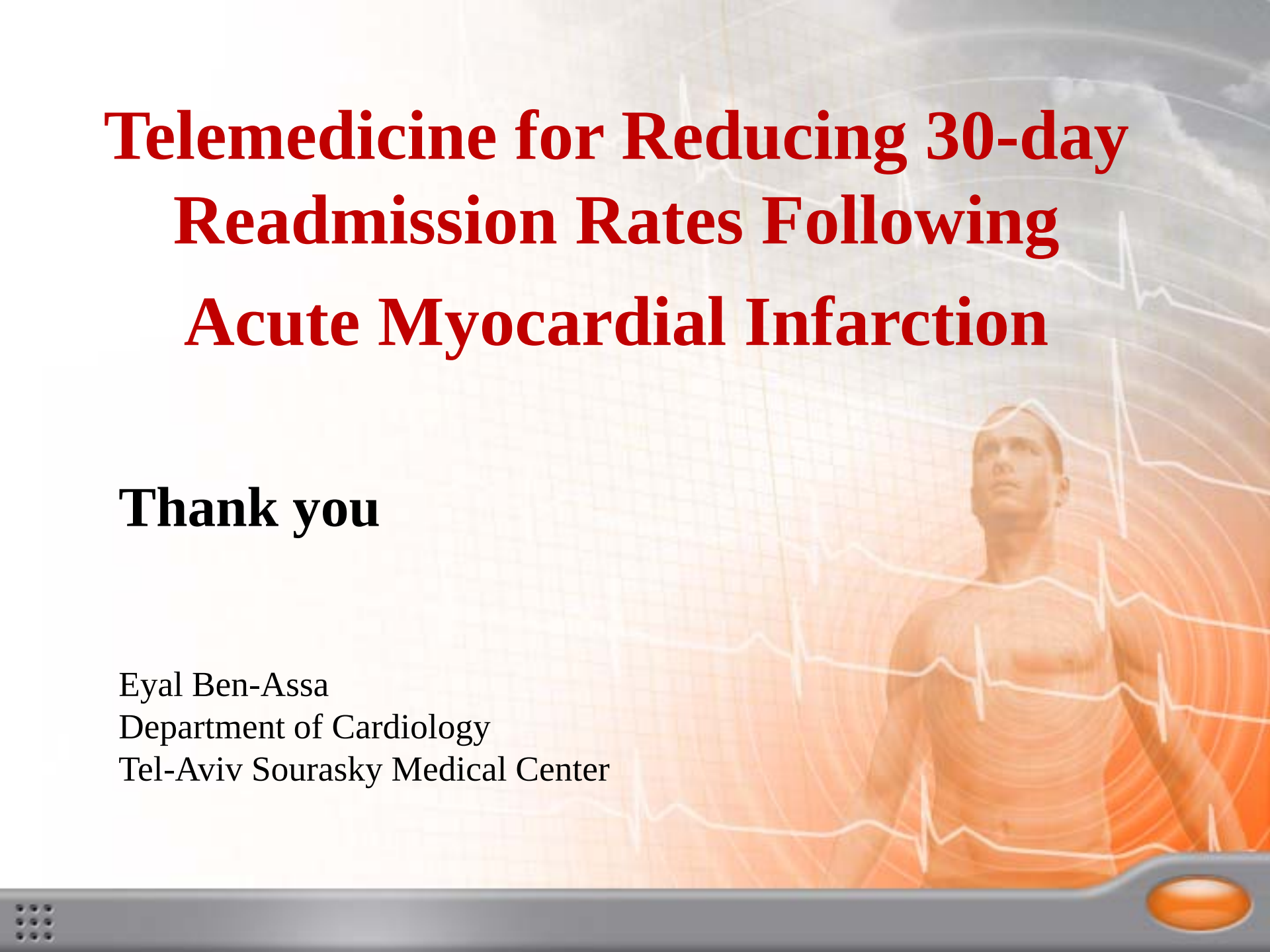

Results: Chronic medication treatment

Characteristic	Non-readmitted (n=845)	Readmitted (n=52)	P - Value
Medication			
Anti-platelets agent, n (%)	669 (79.1)	41(78.8)	0.955
Beta blockers, n (%)	600 (71.1)	35 (67.3)	0.637
Nitrates, n (%)	13 (1.5)	4 (7.7)	0.014
ACE inhibitors, n (%)	503 (59.5)	32 (61.5)	0.774
Calcium channel blockers, n (%)	55 (6.5)	8 (15.4)	0.024
Statines, n (%)	658 (77.8)	41 (78.8)	0.869
Diuretics, n (%)	113 (13.3)	10(19.2)	0.296
Hypoglycemic agent, n (%)	121 (14.3)	5 (9.6)	0.416

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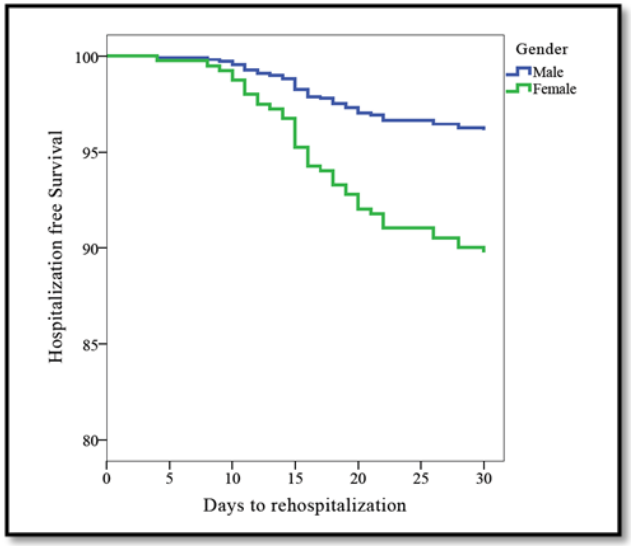
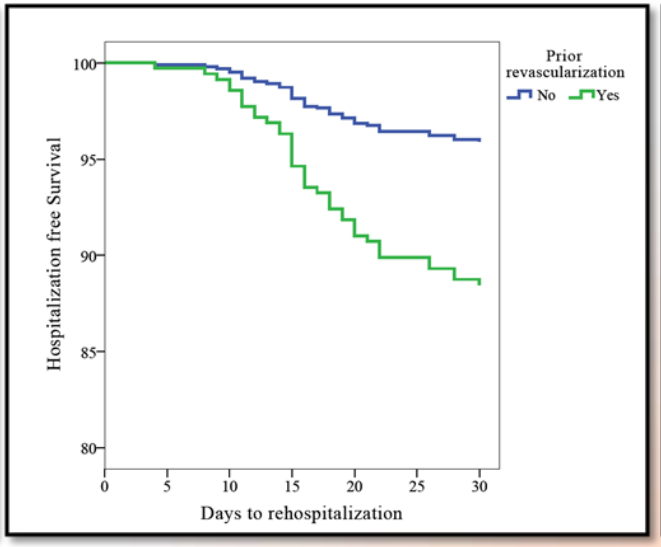
Telemedicine characteristic (mean ± SD)			
Number of calls to the center per patient	3.6±3.3	5.9±3.0	<0.001
Number of ambulances dispatched per patient	0.12±0.4	1.12±0.9	<0.001
Number of hospital transports per patient	0.03±0.2	0.77±0.6	<0.001

Results: **Readmissions over time**

Gender



Prior revascularization



Use of Nitrates