

CF Medcare App: Maximising Adherence in the Digital Era

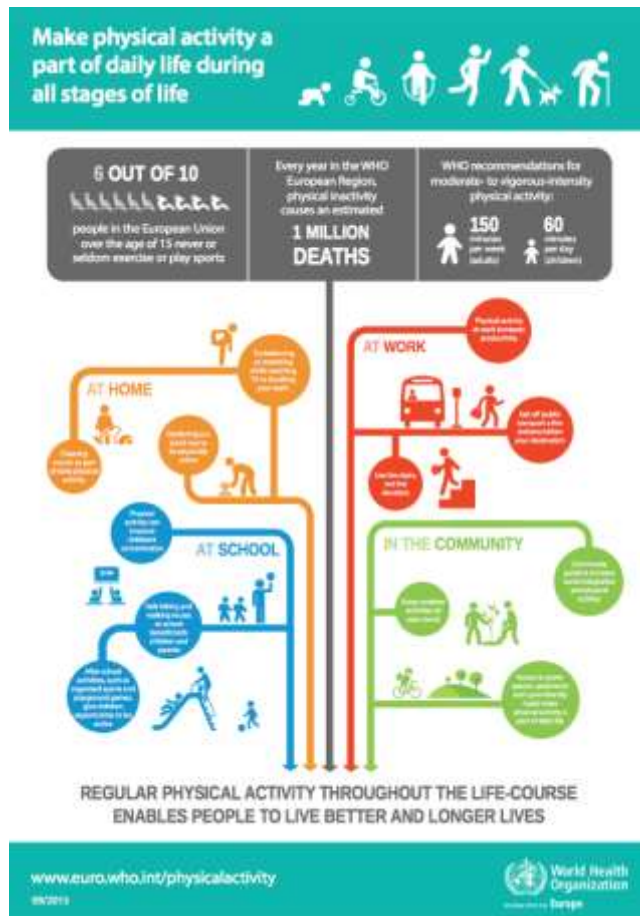
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App store opened 2008

A digital revolution on health care
Health Apps influencing daily life!



The age of Tele Medicine: Apps and Chronic Illnesses

- Heart
- Diabetes
- High Blood pressure
- Depression

What about CF: can these Apps help adherence?

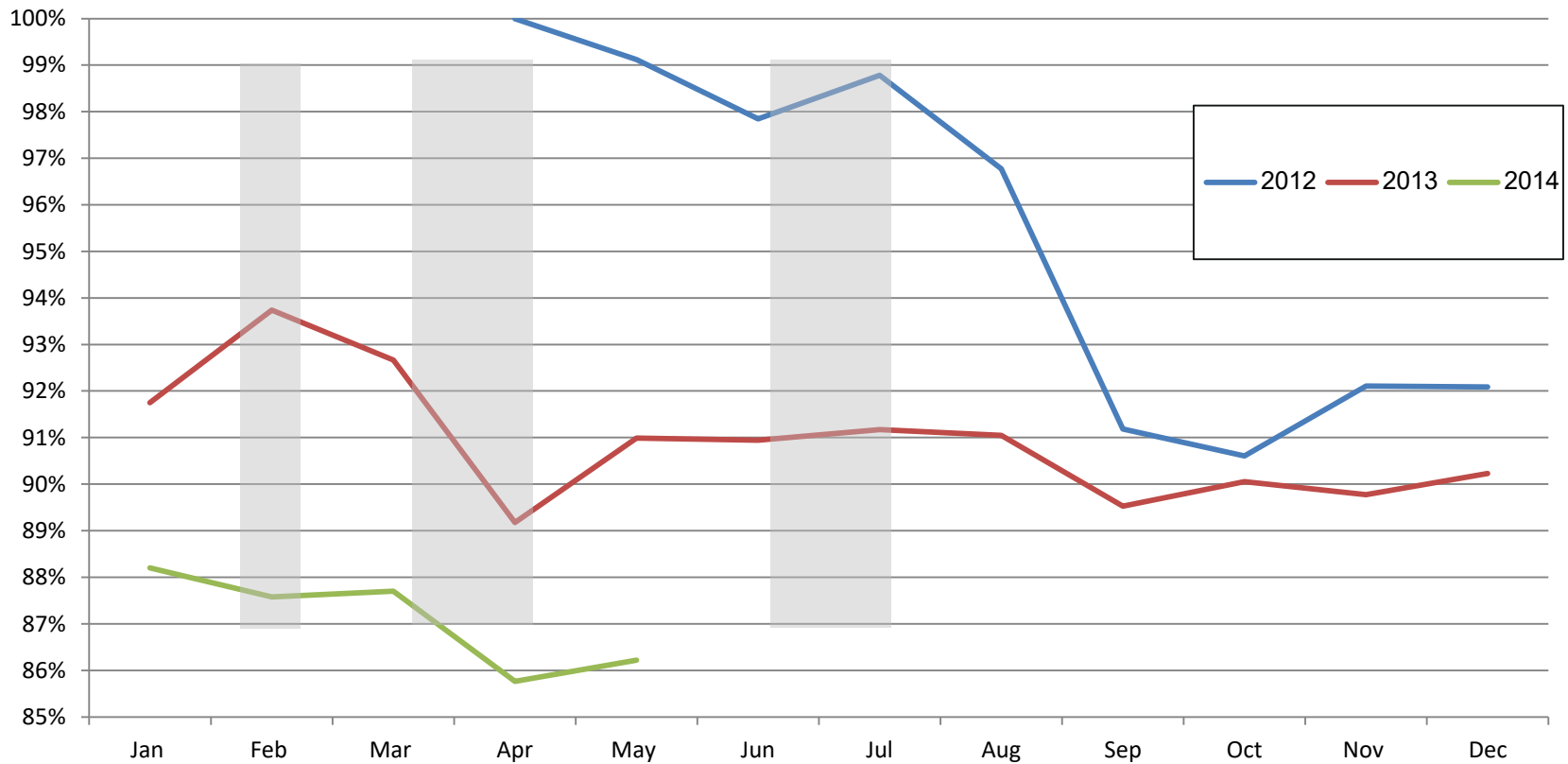
Physiotherapy	30 min	2 x per day	60min
Nebulized drugs	20min	2 x per day	40min
Exercise	30min	1 x per day	30min
Increased nutritional needs	60min	Daily addition	60min

190min per day!

Complex and time-consuming daily treatment regimens!

Any disruption to a patient's routine negatively impacts compliance

Combined EU compliance shows clear seasonal pattern

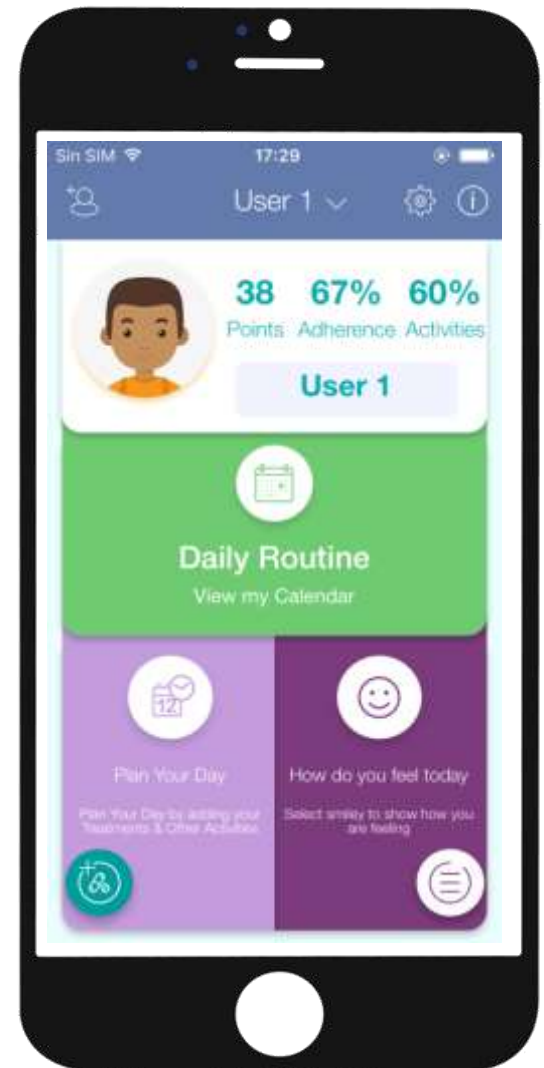


Using the digital age for face adherence



CF MedCare

- Smartphone app used worldwide, that can help CF patients to better manage their treatment regimens
- Cystic fibrosis treatment reminder app created by Vertex, with new and improved design and features! – version 2 coming soon!



Aim of the CF App

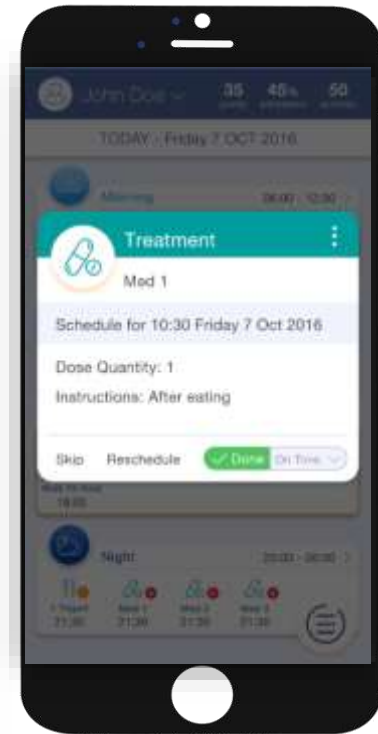
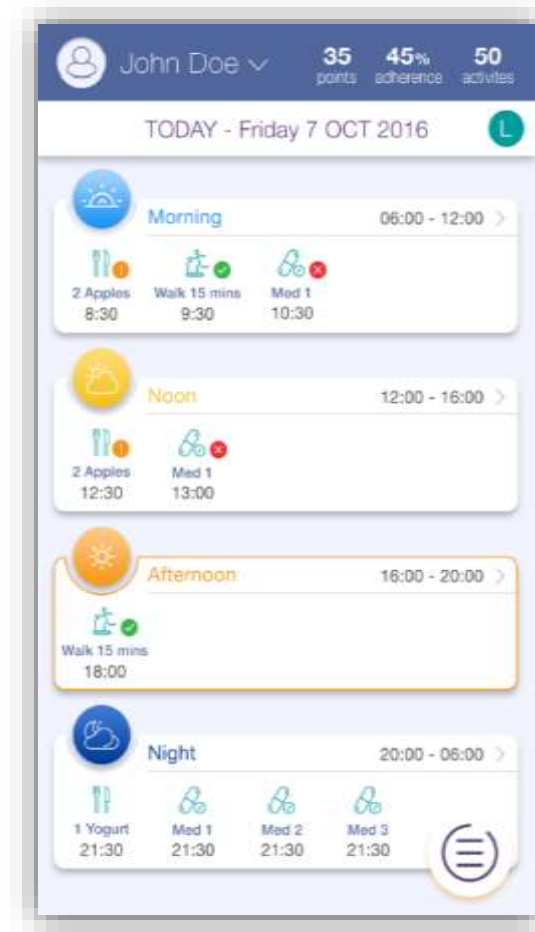
- Improve **adherence** on a **regular** daily basis
- To encourage CF patients to **take responsibility** and better care of themselves
- Allows doctors and CF team to work together:
 - monitoring patient behavior
 - viewing symptoms
 - flare up of disease
 - intervene when non complying

Remote monitoring and behavioral modification with
personalized intervention

CF MedCare App

CF MedCare Treatment Reminder app is here to assist the people and fulfill their needs

The app is designed and developed to help them remember and at the same time be fun and enjoyable, so the user can use it for all his day-to-day activities!



Create a Profile

The user creates his Profile
Friendly and easy to use



Add Medicines/Activities

The user adds his medicines and other daily activities, including:

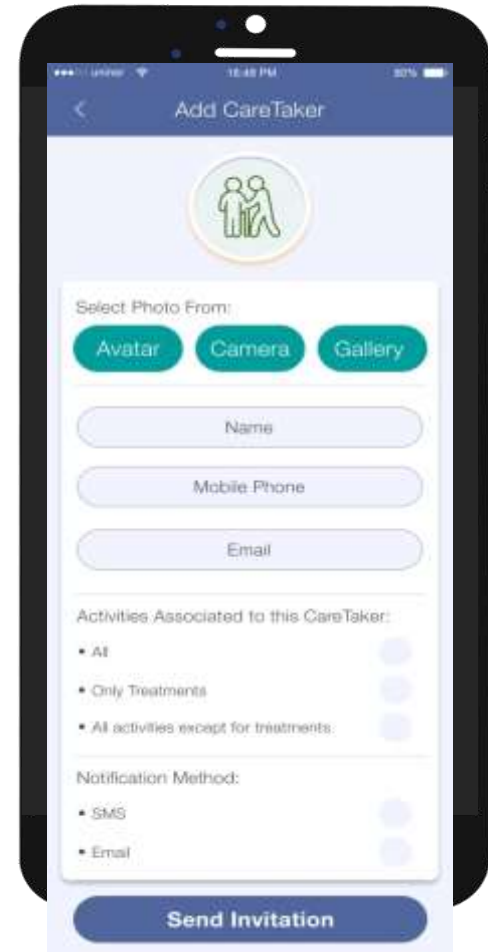
- diet
- exercise
- medical appointments



Invite Caretaker/CF Team Member

The user can invite one or more family members or doctors, called **CareTakers**, in order to help him remember to do his activities and take his medicines, in case he forgets.

The CareTaker receives the invitation, and can **Accept** or **Reject** it

A screenshot of a mobile application interface for adding a CareTaker. The screen is titled "Add CareTaker" at the top. Below the title is a circular icon with a green outline and a white background, showing two stylized figures. Underneath the icon is a section labeled "Select Photo From:" with three buttons: "Avatar", "Camera", and "Gallery". Below these buttons are three input fields for "Name", "Mobile Phone", and "Email". Further down is a section labeled "Activities Associated to this CareTaker:" with three radio button options: "All", "Only Treatments", and "All activities except for treatments:". Below this is a section labeled "Notification Method:" with two radio button options: "SMS" and "Email". At the bottom of the screen is a large blue button labeled "Send Invitation".

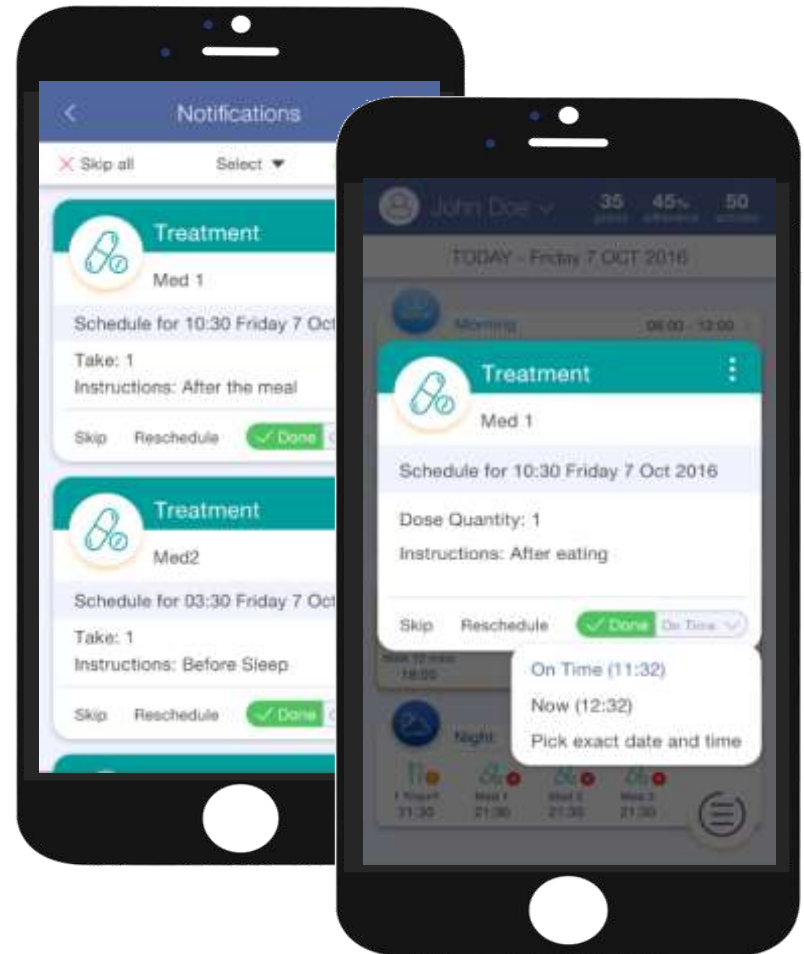
Receive Notifications

According to the set Schedule, the user receives a **Notification** in his device, when it's it time to take his medicine or do a scheduled activity.

Remind to re-order medicine

If the user does not take any action the moment the notification comes...

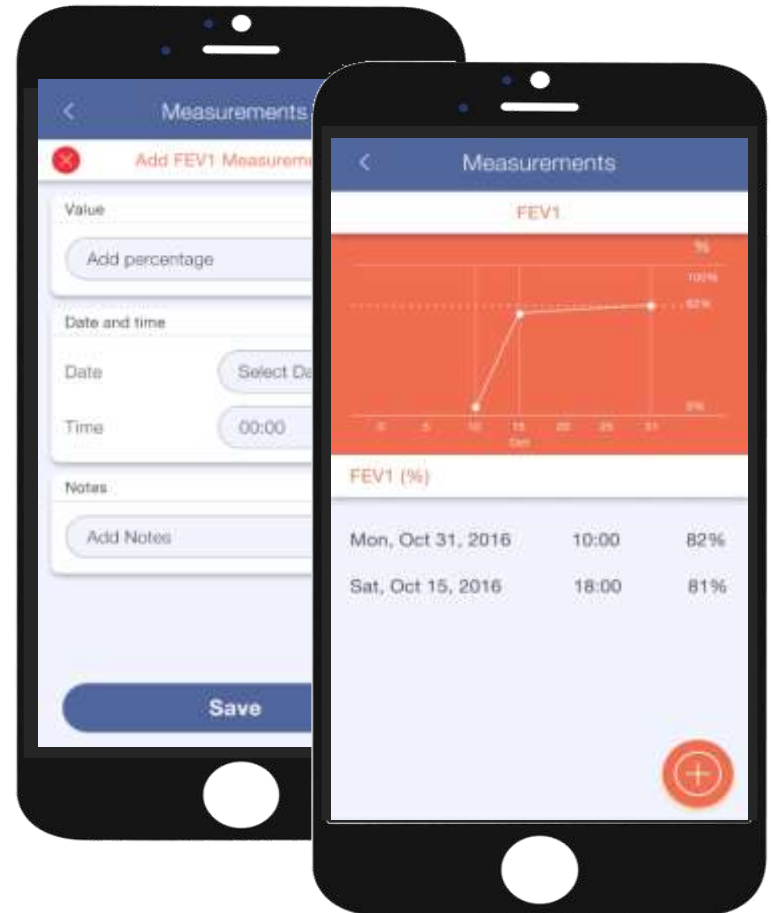
... when he eventually opens the app, he will see a list of all active notifications that need an action



Measurements

The user can also keep track of various important measurements, starting with **FEV1**

Tracking feelings and disappointments



App Rewards

The app encourages the user to use more frequently the app, and finds ways to reward him!

- When he opens the app
- When he adds an activity
- When he takes his medication and performs his activities
- etc.

• Depending on his actions within the app, he earns different Points & Badges



History & Adherence

The user can see his Activities History and Adherence Level, regarding his Treatment and/or his Daily Activities

The information is available both in linear and graphical format, for a user friendly experience!



The user's History can be exported and sent for further analysis to his doctor/CareTaker

Research in mobile app in other chronic illnesses: 1

- 501 pre diabetic participants
- 1 year research digital health and coaching with core lessons
- Subjects lost 7.5% of their initial weight after 12 months, improved blood-sugar levels, and lowered cholesterol
- Also **significant** improvements in self-care, diet and exercise, and lower feelings of depression and isolation

Journal of Aging and Health, 2017, Jan

Research in mobile app in other chronic illnesses: 2

- COPD patients
- Daily use of smartphone to report symptoms including breathlessness, cough, wheezing and sore throat, and use hand-held meters to measure the air flowing in and out of their lungs
- Data immediately received measures how serious symptoms; refers urgent cases for same-day therapy
- Drs communicate via text or email back to patients who can respond that they will comply or that they may need something else
- Study found that patients using app daily experienced fewer and less severe exacerbation symptoms, leading to improved symptom control, lung function and activity status

Telemedicine and e-Health, 2015

Compliance and kalydeco app users

CF patients using the app have high self-reported Kalydeco compliance (higher than country averages)

Country	Jan	Feb	Mar	Apr	Jan	Feb	Mar	Apr
	Kalydeco app users				Kalydeco compliance			
UK	42	47	50	51	96.4%	96.7%	96.5%	96.5%
Germany	5	7	8	8	93.2%	94.4%	94.3%	94.1%
Ireland	6	9	9	10	96.1%	95.8%	95.9%	95.1%
France	6	7	7	7	95.2%	95.1%	95.0%	94.7%

Note: This is self reported adherence which is likely to be an overestimate

Caveat: Patients who download the app are more likely to be motivated to take treatment

What about age?

Each age represent different challenges

- 6 – 10: parents in charge, limited use of phone
- 11-14: Begin to take responsibility and question treatment at all!
- 15-18: Fatalistic attitude/ rebellion/ use a health app but not one that promotes illness
- 19 +: Life priorities, Disease education refresher

Good patient/HCP communication leads to better compliance, HCPs trained in communicative skills have higher compliance

Meta Analysis 106 correlational studies and 21 experimental interventions of patient adherence and communication with their physician

Results:

Across 106 studies (where, as shown in Appendix A, all except two effects are positive), the relationship between respondents' adherence and their physicians' communication is strongly positive and significant ($p < .001$) with both fixed and random effects tests (weighted mean and unweighted mean, respectively). Based on the random effects model unweighted mean r , there is a 19% higher risk of nonadherence [$r = .19$, 95% CI = .16, .21] among patients whose physician has poor communication than among patients whose physician communicates well. The fail-safe n is well above the "tolerance level" of 540 ²³ and indicates that over 28,563 studies with null effects would need to exist, and have been missed by our search strategies, in order to render this finding nonsignificant. Nonadherence is more than 1.47 times greater (standardized relative risk) among individuals whose physician is a poor communicator, and the odds of a patient adhering are 2.16 times better (standardized odds ratio) if his or her physician is a good communicator.

Conclusion

- Each individual approaches their CF differently
- CF App **on its own** is not enough: needs **ongoing** personalized support and **communication** WITH CF team

Thank You!

