

The Upload on Rehab Minder Exercise Prescription Apps Software



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Rehab Minder Hand Therapy App had an extraordinary conception. In 2012, I found myself on the opposite side of the therapy table than what I was used to. I was working part-time in hand therapy, a mother of two young children, and a physiotherapy patient for a chronic condition. As health professionals we assume that we would be outstanding patients but in my case adherence to a home program was inconsistent. It was difficult to superimpose a home program on top of the daily life demands. What I really wanted was an app on my phone to remind me of my exercises and when to do them. It struck me - my physiotherapist was asking me to do exercises a few times a day, yet often we are asking our patients to attempt hourly exercises. Surely hand therapy patients would want such an app to assist them in adhering to a home program too. So, I started designing it.

The first dedicated hand therapy exercise prescription software was built following a 14 month collaboration with an app development company. Rehab Minder was released on the

App Store in May 2013 (see figure 1). The design elements from the perspective of a therapist were to have a quick set up, and adjustable parameters for the exercises. Any extra instructions could be typed in. From the perspective of being a patient, I wanted the reminders, the exercises demonstrated, and to have a record of my adherence so I could feedback to my therapist with some accuracy.

Some of the technical decisions for the app were influenced by where I live. Perth, Western Australia is one of the most isolated cities on the planet. Our state is over a million square miles (2.6 million square kilometers) and the healthcare services in Perth have to cater for rural and remote patients. We have a good Patient Assisted Travel Scheme but attendance to therapy can be affected by the geographical context. Mining and resources are major industries with a large fly-in fly-out workforce.

When designing Rehab Minder, it needed to be a tool that could work anywhere, anytime without telephone network or Wi-Fi connection. This could be achieved with a native app platform. The intention was to build it for iOS (Apple iPhone) first and then Android.

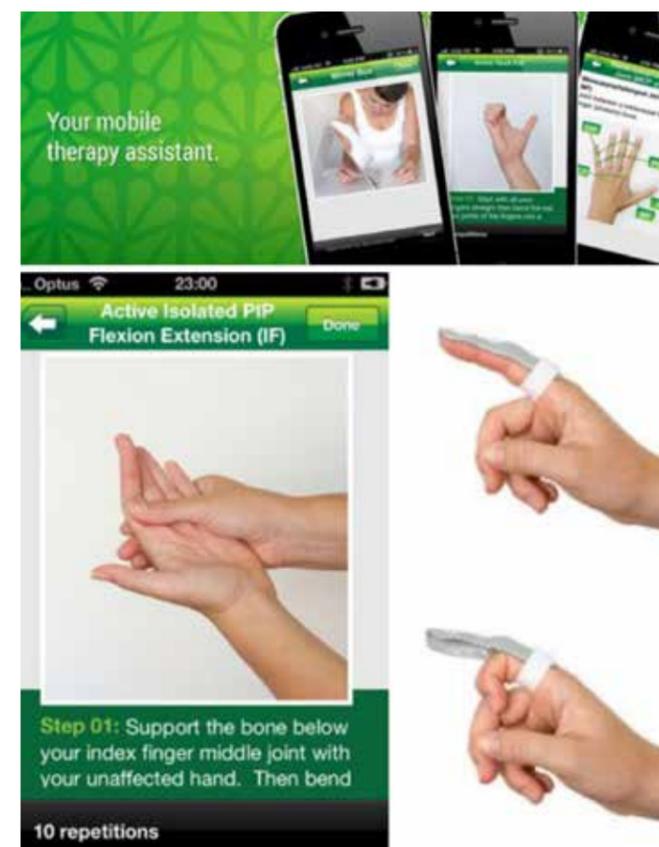


Figure 1: Images from Rehab Minder iOS app. Movement is demonstrated with GIF images rather than video to keep the storage size of the app low

Research was undertaken to consider the efficacy of Apps used in healthcare. Do they promote behavior change and adherence to therapy? O'Brien (2012) in his editorial on improving adherence to hand therapy exercise programs highlighted that education in a consultation alone does not translate to the patient recalling instructions. Adherence can be optimised by teaching the patient to use alarms and timers (Radomski, 2011). Systematic reviews by Free et al. (2013) and Mosa et al. (2012) on mobile healthcare applications provided validation that apps were an emerging and useful tool for enhancing patient care and education. Even though the technology was relatively new, healthcare apps had already shown a benefit in smoking cessation, medication management, diabetes, chronic disease management, and short-term benefits for physical activity interventions (Free et al., 2013; Mosa et al., 2012; Zeng et al., 2016).

Prior to healthcare apps there had been studies undertaken on the use of video and DVD to enhance home exercise programs with high patient satisfaction and self-reported adherence (Kahlil et al., 2012; Kingston et al., 2009). Reo and Mercer (2004) concluded that live and video modelling of exercises is more effective than handouts for achieving performance accuracy in an exercise program.

By 2014, Rehab Minder was ready for an upgraded version. More exercises were added, including dynamic stabilising exercises for wrist and thumb, taking the count to 343 elbow, wrist and hand exercises. The app installation was also split into two stages for a few reasons. It would be quicker to install, not require Wi-Fi to download, and the patient could get started with a limited version of the app with only active range of motion (AROM) exercises. The second installation of the app was for the remaining therapeutic content: non-exercise therapy, passive ROM, active-assisted ROM, and resisted exercises. A summary of the program is able to be emailed to the practitioner for easy documentation.

Native Apps and Cloud-based Apps

Technology in healthcare is an evolving space. By 2017, cloud-based software was extensively available. Native apps (a software program that is developed on a particular platform) are reliable and 'owned' by the patient but cloud-based or web-based apps allow more content, function and communication between the practitioner and patient. Rehab Minder partnered with physiotherapy-built software, TrackActive, so that the specialist hand and upper limb content could be provided as a more progressive exercise prescription tool (figure 2).



Figure 2: Rehab Minder partners with cloud-based software TrackActive in 2017

The advantages of cloud-based software for practitioners includes the functionality, which can be seen in figures 3, 4 and 5, to:

- Access their clinic database over any internet connection
- Curate the database of exercises from the Rehab Minder Hand & Upper Limb (H&UL) content and the physiotherapy TrackActive content
- Add or edit any exercises with text, still images and video
- Utilise templates of condition-specific exercises or create new templates
- Offer free app, printout or email of home exercise programs (HEPs) to patients

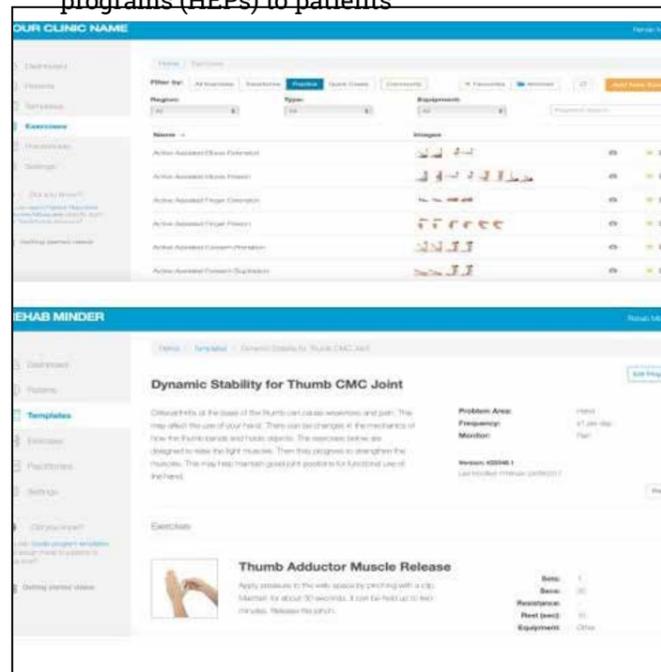


Figure 3: Screenshots of the hand practitioners TrackActive database.

For patients the benefits include:

- Photos or video footage of their exercises being demonstrated
- Clearly see variables like frequency of exercise, weight to use, and number of repetitions
- Setting own reminder times on the app
- Ability to log exercise completion and record

symptom levels

- Ability to write and save comments to discuss with practitioner at next consultation
- Having the contact details of their treating clinic

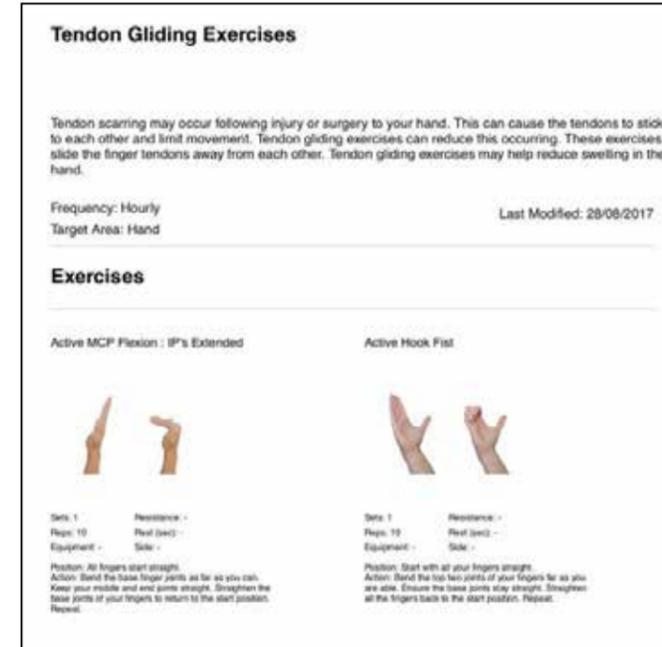


Figure 4: Section of a template PDF from TrackActive

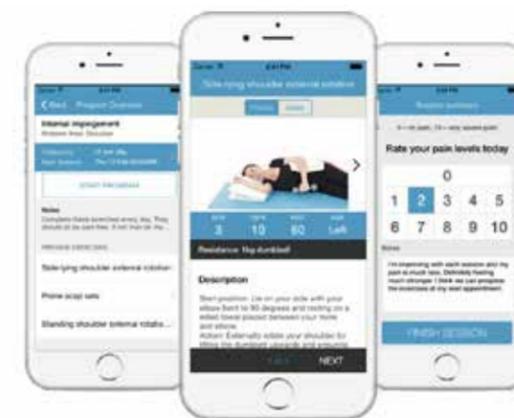


Figure 5: Screenshots of TrackActive patient app attached to their exercises.

The readability of the Rehab Minder H&UL content within TrackActive is ≤ US grade 8 based on the U.S National Institutes of Medicine (2019) and other national healthcare organisations recommendations (Badarudeen & Sabharwal 2010). The language is English, however practitioners are able to edit or

add any content in their own language. Additions or edits of exercises can be shared to other TrackActive subscribing clinics.

Latest Updates

Lin et al. (2019) published 11 best practice recommendations for care in musculoskeletal pain (figure 6). Patient-centred care and the evaluation of progress using standardised outcome measures are part of those recommendations. Finding out what is a priority for the patient can be quantified on the app using the electronic Patient Specific Functional Scale (Stratford, 1995). A battery of Patient Reported Outcome Measures (PROMs) has also been added for body regions including the Disabilities of the Arm Shoulder and Hand (DASH) (Hudak et al., 1996), QuickDASH (Beaton et al., 2005) and the Upper Limb Functional Index (Gabel et al., 2006).

11 Best Practice Recommendations for Care in Musculoskeletal Pain

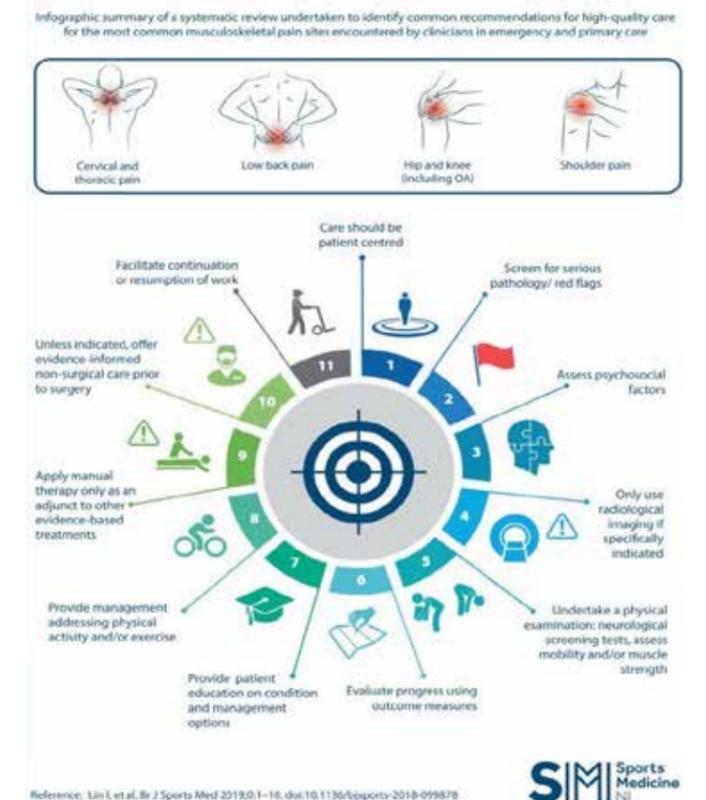


Figure 6: Best practice recommendations for care in musculoskeletal pain.

The Örebro Musculoskeletal Screening Questionnaire (Gabel et al., 2012) in short form is also included. These PROMs are scored, recorded and re-administered within the secure software. The patient can complete these in the clinic, or via link that is emailed.

Since 2017, more research on electronic health has become available. A randomised trial of using an app with remote support does achieve better outcome than paper handouts alone for people with musculoskeletal conditions (Lambert, 2017). Ouegnin and Valdes (2019) reported 69% of patients in a convenience sample preferred HEPs in video format compared to paper. Providing HEPs in electronic format reduces barriers to program adherence. Programs can't get lost, alarms and reminders are built in, and the capability of the patient to review exercise demonstrations are easy to access.

A survey of Certified Hand Therapists in the USA reported more than 93.2% rated a clinical app with HEPs as moderately to extremely important, figure 7 (Short, 2018).

In addition to the Rehab Minder iOS app, there are two other native exercise prescription apps available to hand practitioners. Physiotherapist Laura Edwards (née Parker) developed the CORE Hand iOS app at

the Pulvertaft Hand Unit in Derby, UK. Chelsea & Westminster Hospital, also in the UK, launched a hand therapy app in 2017.

Functional exercise prescription is the backbone of a patients' recovery and follows client-centered treatment. With the past decade of App and cloud-based software development, we now have more tools that we can utilise to benefit the workflow of practitioners and the adherence of patients to therapy.

The TrackActive software offers a free 30 day trial at www.trackactive.co

To request the Rehab Minder H&UL therapy module email support@trackactive.co and identify yourself as a hand practitioner. Should you take on a subscription to TrackActive a 50% discount will be applied to your account for the first 6 months. During signup, apply the coupon code RehabMinder50 to have this discount automatically added to your account.

These instructions can also be found at <https://www.trackactive.co/trackactive-rehabminder/>

The Rehab Minder iOS app can be found at <https://apps>.

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- apple.com/au/app/rehab-minder-therapy-assistant/id647025352 and is free for the first AROM installation and the second in-app purchase.

Preferential components to be included in a potential clinical app

In your work as a CHT, please rate the following components of a potential electronic application that you would find beneficial in the clinic based on level of importance:

Answer options	Extremely important	Very important	Moderately important	Slightly important	Not important	Response count
Home program accountability/reminder tracking	74 (22.2%)	103 (30.9%)	98 (29.4%)	40 (12.0%)	18 (5.4%)	333
Home program illustrations and video demonstrations	169 (50.0%)	103 (30.5%)	43 (12.7%)	12 (3.6%)	11 (3.3%)	338
Evidence-based and best practice resources	151 (44.8%)	106 (31.5%)	64 (19.0%)	14 (4.2%)	2 (0.6%)	337
Special tests (ie, Froment's test, Finkelstein's test, etc.)	85 (25.1%)	103 (30.4%)	90 (26.6%)	41 (12.1%)	20 (5.9%)	339
Conservative protocols	81 (24.2%)	102 (30.5%)	104 (31.0%)	31 (9.3%)	17 (5.1%)	335
Postoperative protocols	122 (36.4%)	107 (31.4%)	74 (22.1%)	26 (7.8%)	6 (1.8%)	335
Custom orthosis demonstrations	67 (20.0%)	90 (26.9%)	84 (25.1%)	64 (19.1%)	30 (9.0%)	335
Functional outcome measures (eg, DASH)	111 (32.9%)	126 (37.4%)	58 (17.2%)	35 (10.4%)	7 (2.1%)	337
ROM norms	52 (15.7%)	75 (22.6%)	95 (28.6%)	72 (21.7%)	38 (11.5%)	332
Standardized assessment norms (eg, 9-Hole Peg Test)	57 (16.9%)	107 (31.7%)	100 (29.6%)	56 (16.6%)	18 (5.3%)	338
Answered question						339
Skipped question						2

CHT = certified hand therapists; DASH = Disabilities of the Arm, Shoulder and Hand questionnaire; ROM = range of motion.

Figure 7: Taken from Short N, LaRowe J, Treherne T, Francis O, Garau C, Schutt M, Wei CY. Exploring the needs of certified hand therapists regarding electronic applications. *Journal of Hand Therapy*. 2018, 31: 52-8.