of the Ringer's solution (150 ml h^{-1}) contributed to the precipitates observed. Precipitates collected at the joint between the drip needle and the i.v. line because as the lumen narrows, the infusion flow slows at this site.

As remimazolam forms precipitates in i.v. lines with Ringer's acetate or lactate solution, the combined use of remimazolam and Ringer's solutions should be avoided. If combined use of them is essential, lower concentrations remimazolam, higher infusion rates of Ringer's solution, or both are recommended to avoid precipitate formation.

Declarations of interest

The authors declare that they have no conflicts of interest.

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Prescription for unguided mobile health applications

Rajat N. Moman[1,*] and W. Michael Hooten[2]

[1]Department of Anesthesiology and Perioperative Medicine, Mayo Clinic, Rochester, MN, USA and [2]Division of Pain Medicine, Mayo Clinic, Rochester, MN, USA

*Corresponding author. E-mail: moman.rajat@mayo.edu

Keywords: chronic pain; COVID-19; digital health; electronic health; meta-analysis; mobile health

Editor—In a recent issue of *British Journal of Anaesthesia*, Li and colleagues[1] discuss the use of digital health for patients with chronic pain during the coronavirus disease 2019 (COVID-19) pandemic. The authors rightly point out that the COVID-19 pandemic has led to isolation and that patients with chronic pain are particularly vulnerable to the negative effects of this pandemic. The authors make a timely suggestion that digital health platforms may offer a solution to patients with chronic pain who lack healthcare access. Their discussion includes specific types of platforms and their drawbacks. They make the case that telehealth requires too much capacity for a health system and is unsustainable. In the case of online health communities, they cite lack of regulatory oversight. They point to chatbots as a possible solution that allows for patient counselling, support, and symptom triage; yet, the cited intervention lacked a significant effect on the outcomes of pain intensity, pain-related impairment, and general well-being[2] when compared with a control condition. Lastly, they mention the important role of psychologists and therapists in the direct care of chronic pain patients.

The authors present a balanced discussion of alternative strategies for care delivery during the pandemic. However, outside of discussion limited to chatbots, we note the relative absence of information about unguided electronic health (eHealth) and mobile health (mHealth) applications, or applications that do not require clinician contact or feedback. These unguided applications avoid some of the drawbacks associated with other digital health interventions in that they do not demand clinician involvement and they have a modest effect on clinically relevant outcomes. We believe the results of our recent meta-analysis that explored unguided eHealth and mHealth applications can add to this discussion.[3] In this meta-analysis, our *a priori* study outcomes were designed based on the Initiative on Methods, Measurement, and Pain Assessment in Clinical Trials criteria for chronic pain clinical trials.[4] Our meta-analysis pooled outcomes from 17 different RCTs of 17 different eHealth and mHealth interventions. We

Table 1 Studies on unguided electronic and mobile health technologies for chronic pain from our meta-analysis[3] and their current availability. AHRQ, Agency for Healthcare Research and Quality; CJE, Council for Jewish Elderly; DOD, Department of Defense; LSDF, Life Sciences Discovery Fund; N, no; NHMRC, National Health and Medical Research Council; NIH, National Institutes of Health; REHSAM, Rehabilitering och Samordning; U, unknown; VA, Veterans Affairs; Y, yes. *The current Headzup application was available on Apple's application store, but not on Google Play. The application is designed to recruit teenagers with recurrent headaches for an NIH-funded study according to the application description. This differs from the indication studied in the publication included in our meta-analysis, which was low back pain. †The Livanda.se programme was published in two peer-reviewed articles; one article was included in the meta-analysis.

Study (author, year)	Intervention(s)	Intervention name	Included in meta-analysis?	App available (March 2019)?	Site available (March 2019)?	English?	Study funding
Berman, 2009	Computer-based mind/body exercises		Y	N	N		Grant from CJE SeniorLife
Bossen, 2013	Computer-based Join2move: self-paced programme, in which a patient's favourite recreational activity is gradually increased in a time-contingent way	Join2Move	Y	Y; Join2Move	N	Y	None
Calner, 2017	Internet-delivered intervention coupled with multimodal rehabilitation therapy	Livanda.se†	Y	N	Y, Fee for service (https://www.livanda.se/)	U	Grant from REHSAM
Carpenter, 2012	Online cognitive behavioural therapy intervention (*Wellness Workbook*) for individuals with chronic low back pain	*Wellness Workbook*	Y	N	N		Grant from the NIH
Chiauzzi, 2010	Online painACTION: back pain self-management website	PainACTION:Back Pain	Y	N* (Headzup app by Inflexxion, Inc.)	Y (https://www.painaction.com/: forum design)	Y	Grant from the NIH
Davis, 2013	Online mindfulness intervention		N	N	N		Grants from the Arizona Institute for Mental Health Research and Pfizer
Dowd, 2015	Computer-based mindfulness in action		Y	N	Y (https://www.nuigalway.ie/colleges-and-schools/arts-social-sciences-and-celtic-studies/psychology/research/affiliated-centres/centreforpainresearch/mindfulness/: link to YouTube channel)	Y	None
Guillory, 2015	Mobile		Y	N	N		Grants from the NIH and AHQR
Hedman-Lagerlof, 2017	Internet-based exposure therapy		Y	N	N		Grants from the Fredrik and Ingrid Thuring Foundation, Soderstrom-Konig Foundation, Stockholm County

Continued

Table 1 Continued

Study (author, year)	Intervention(s)	Intervention name	Included in meta-analysis?	App available (March 2019)?	Site available (March 2019)?	English?	Study funding
							Council, and Karolinska Institutet
Henriksson, 2016	Computer-based mindfulness programme	Mindfulness for Stress Reduction	Y	N	Y (fee for service; https://www.mindfulnesscenter.se/en)	Y	None
Krein, 2013	Internet-based automated feedback		Y	N	N		Grants from the VA and University of Michigan
Lin, 2017	Internet based		Y	N	N		None
Menga, 2014	Computer-based moodGYM based on cognitive behavioural and interpersonal therapy	MoodGYM	Y	N	Y (https://moodgym.com.au/)	Y	None
Nordin, 2016	Internet-delivered web behaviour change programme for activity (Web-BCPA) was developed and added to multimodal pain rehabilitation (MMR)	Livanda.se†	N	N	Y; fee for service (https://www.livanda.se/)	U	Same as Calner and colleagues
O'Moore, 2018	Computer-based cognitive —behavioural therapy programme	Sadness Program	Y	N	N		Grants from the NHMRC
Rini, 2015	Computer-based painCOACH: online modules of pain coping skills training, included interactive exercises, self-monitoring, and a section to read about others' experience	PainCOACH	Y	N	N		Grant from the NIH
Ruehlman, 2012	Online chronic pain management programme (self-directed and self-paced)	Goalistics Chronic Pain Management Program	Y	N	Y (https://pain.goalistics.com/)	Y	Grant from the NIH
Strom, 2000	Computer-based applied relaxation and problem-solving training		N	N	N		None
Williams, 2010	Adding internet-based self-management programme to standard care	Living Well With Fibromyalgia	Y	N	N		Grants from the NIH and DOD
Wilson, 2015	Computer-based chronic pain management programme focuses on cognitive, behavioural, social, and emotional regulation	Goalistics Chronic Pain Management Program	Y	N	Y (https://pain.goalistics.com/)	Y	Grant from the Washington State LSDF

found that these unguided interventions resulted in statistically significant, yet modest improvements in multiple clinical outcomes of importance to patients with chronic pain: pain intensity, depression, and pain catastrophising. Although these improvements were only modest, these technologies may be more desirable for patients who lack access to typical healthcare and are in need amidst a pandemic.

An important barrier that patients and clinicians who are interested in eHealth and mHealth applications face is that applications that are studied and presented in the medical literature are not always available to patients.[5] With that in mind, we previously published a list[6] of eHealth and mHealth applications that were reported in our meta-analysis and are available to interested patients and clinicians (Table 1; search date: March 2019; see table 1 of Moman and colleagues[3]). We hope this list will be a good starting place for clinicians interested in learning more and possibly incorporating these applications in their daily practice.

Declarations of interest

The authors declare that they have no conflicts of interest.

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Thresholds of functional capacity using the four-question (modified) Duke Activity Status Index (M-DASI-4Q) as a screening tool: observations from the Measurement of Exercise Tolerance Before Surgery (METS) study

Chun H. A. Lee[1], Hilmy Ismail[1,2,3], Kwok M. Ho[4,5,6], Bernhard Riedel[1,2,3,7,*] and Robert Schier[8]

[1]Division of Cancer Surgery, Peter MacCallum Cancer Centre, Melbourne, Australia, [2]Department of Anaesthesia, Perioperative and Pain Medicine, Peter MacCallum Cancer Centre, Melbourne, Australia, [3]Centre for Integrated Critical Care, University of Melbourne, Melbourne, Australia, [4]Department of Intensive Care Medicine, Royal Perth Hospital, Perth, Australia, [5]Medical School, University of Western Australia, Perth, Australia, [6]School of Veterinary and Life Sciences, Murdoch University, Perth, Australia, [7]Sir Peter MacCallum Department of Oncology, University of Melbourne, Melbourne, Australia and [8]Department of Anaesthesiology and Intensive Care Medicine, University Hospital of Cologne, Germany

*Corresponding author. E-mail: bernhard.riedel@petermac.org

Keywords: cardiopulmonary exercise testing; cardiovascular risk; Duke Activity Status Index; functional capacity; METS study; preoperative screening; risk assessment

Editor—The international, multicentre Measurement of Exercise Tolerance Before Surgery (METS) study[1] of 1401 patients scheduled for abdominal surgery showed that subjective assessment of functional capacity should not be used for preoperative risk assessment, with only 19.2% (95% confidence interval [CI], 14.2–25.0%) sensitivity for predicting functional capacity defined as peak VO_2 <14 mL kg^{-1} min^{-1}. The Duke Activity Status Index (DASI) had construct validity for predicting functional capacity in surgical patients and improved predictive ability for postoperative myocardial injury. Nevertheless, cardiopulmonary exercise testing (CPET) was superior to the DASI in predicting in-hospital moderate or severe complications. CPET, however, is a resource-intensive test and by its nature a high aerosol-generating procedure with ramifications given the current coronavirus diseases 2019 (COVID-19) pandemic. The DASI