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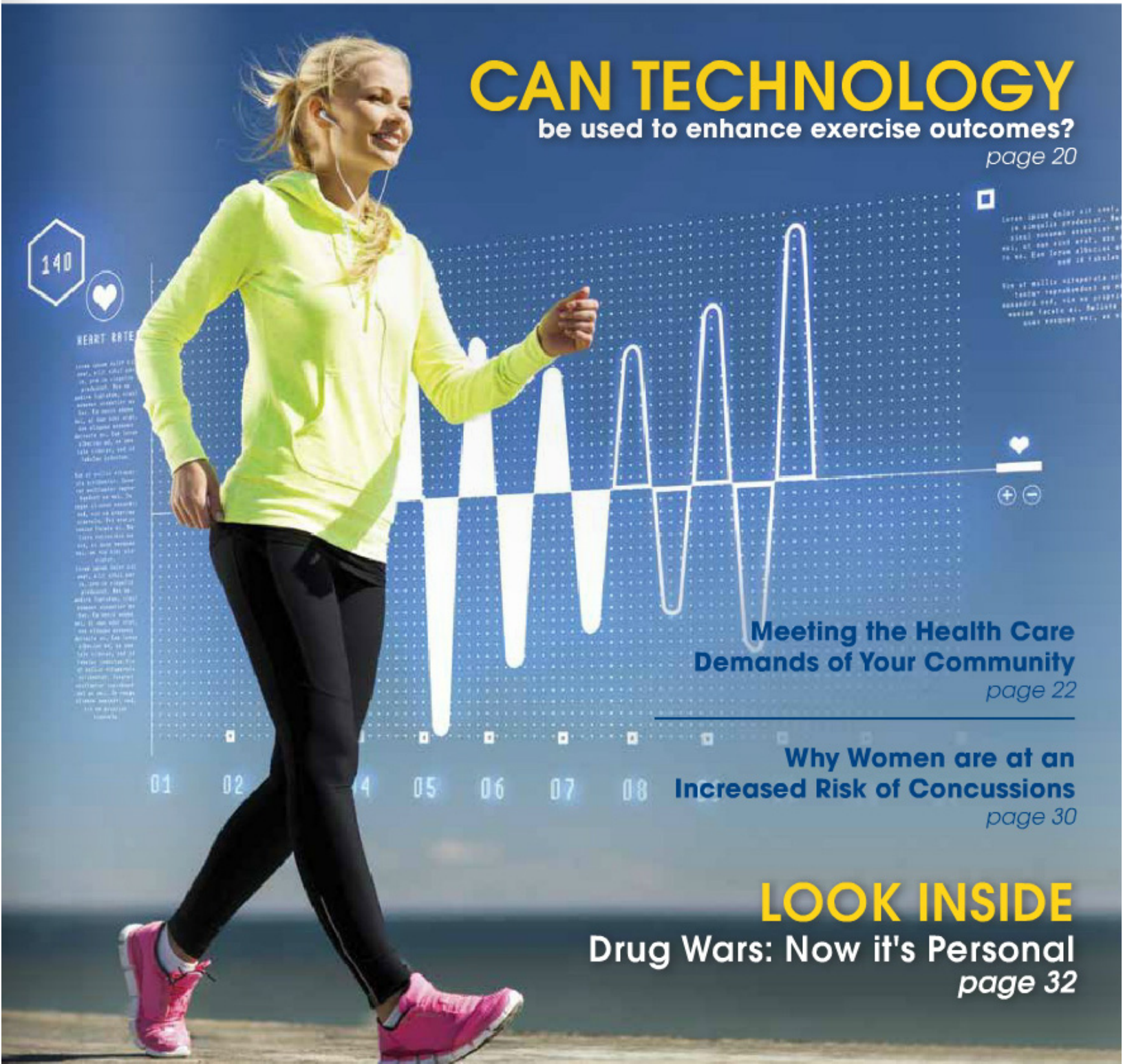

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CAN TECHNOLOGY BE USED
to enhance exercise outcomes?

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EXERCISE IS VITAL FOR GENERAL HEALTH, PHYSICAL FITNESS, OVERALL WELLNESS, and is thoroughly documented as an effective approach for prevention and treatment of various disorders, such as back and neck pain.[1,2] The traditional delivery model for therapeutic exercise programs involves direct supervision with patients/clients throughout all phases of care.

Evidence reveals that exercise for improving treatment outcomes, fitness, athletic performance, injury prevention, and body composition is optimized when the patient/client is supervised by a clinician or qualified exercise specialist (i.e. trainer).[3,4] While this direct supervised exercise approach is effective, it is often not practical for implementation. Some of the barriers to participation in a supervised exercise program may include lack of time and resources (e.g. financial), which could result in poor adherence and less than optimal outcomes.

The use of technology, such as web-based and smart phone applications that allow remote monitoring and guidance, is a growing trend in exercise and wellness. Options range from interactive formats where users can view and move with an on-screen trainer, to apps where the user can log repetitions and record movement via self-report workout logs. Many apps provide a framework to compete with others in the app "community" allowing users to compare their stats and set personal goals. While some apps provide a mechanism for tracking exercise and posture through the use of images and videos, most rely heavily on self-reporting of exercise performance.

Patients/clients may benefit from these technological fitness approaches, as they are able to exercise on their own schedule, potentially in their own home, reduce transportation issues and financial burden. Clinicians may benefit from the use of these state-of-the-art approaches, as they are able to help more patients, view documented progress via a system report and provide a more whole person approach by including training options in their treatment methods. As a result, improved adherence and better outcomes may be achieved in a cost-effective manner.

However, there are potential weaknesses with these new technological training processes. For example, many of these approaches fully rely on self-report of exercise performance and require a certain level of technical savvy. Furthermore, the clinician may not be able to closely monitor exercise form due to the remote nature of delivery. Another hurdle is that numerous options are available causing uncertainty for clinicians. Also, the associated risks with these methods are not well-understood and could be different from traditional, supervised exercise approaches. Lastly, limited research is available to inform clinical decision-making regarding the use of these approaches for exercise. Our current federally-funded study - "Worksite exercise interventions for low

back injury prevention in firefighters" - will provide a better understanding of the clinical effectiveness and utility of a web-based exercise approach (FEMA grant # EMW-2013-FP-00723; ClinicalTrials.gov Identifier: NCT02362243).

Given the factors outlined above, we recommend that clinicians consider using technology to help deliver exercise for patients/clients with the following guidance:

1. Utilize web and application based approaches to complement traditional supervised training. We recommend a hybrid based approach combining directly supervised exercise training sessions, particularly during the early stages of care, with an application or web based exercise coaching format over the long-term. Utilizing both directly supervised and technology-based delivery of exercise provides intrinsic and extrinsic motivation, along with adequate oversight to ensure safety, proper exercise movement patterns, and progression. Some commercially-available options offer a hybrid approach where users meet monthly with an exercise specialist who delivers a tailored exercise plan, monitors progress, and provides feedback, guidance and motivation.

2. Maintain adequate supervision. Use of technology does not replace appropriate management and supervision by a qualified provider. Clinicians should carefully select an app with a strong adherence success rate, within a framework that best matches their patient management plan and informed consent processes about risks and benefits.

3. Consider patient preferences in the decision-making processes to determine the most appropriate exercise delivery options via technological training. Not every patient will be comfortable using a web or app based training mechanism, thus clinicians may wish to match the patient with the approach.

4. Partner with a qualified exercise specialist. Given the inconsistencies in personal trainers, clinicians should vet the credentials and reputation of anyone to whom they refer patients. Qualified exercise specialists use evidence-based approaches, perform fitness evaluations, pay close attention to technique and form, use proper progressions, and educate clients on proper movement. They also fully understand professional boundaries, do not make claims about treatment of conditions, and refer to licensed healthcare providers when their client presents needs outside their qualifications and skillset. Qualified exercise specialists hold (at minimum) a bachelor's degree in exercise science or related field and a personal training certification that is approved by the National Commission for Certifying Agencies.

In summary, innovative technological methods to enhance exercise delivery are rapidly evolving and have great potential to improve treatment outcomes and the long-term wellness of patients and clients. We recommend that clinicians assess the risks and benefits before incorporating these tech-based formats and consider working with qualified exercise specialists. ◀FCA

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