Remote assessment in sport and exercise medicine (SEM): a narrative review and teleSEM solutions for and beyond the COVID-19 pandemic

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ABSTRACT

Background The COVID-19 pandemic forces sport and exercise medicine (SEM) physicians to think differently about the clinical care of patients. Many rapidly implement eHealth and telemedicine solutions specific to SEM without guidance on how best to provide these services.

Aim The aim of this paper is to present some guiding principles on how to plan for and perform an SEM consultation remotely (teleSEM) based on a narrative review of the literature. A secondary aim is to develop a generic teleSEM injury template.

Results eHealth and telemedicine are essential solutions to effective remote patient care, also in SEM. This paper provides guidance for wise planning and delivery of teleSEM. It is crucial for SEM physicians, technology providers and organisations to co-design teleSEM services, ideally involving athletes, coaches and other clinicians involved in the clinical care of athletes, and to gradually implement these services with appropriate support and education.

Conclusion teleSEM provides solutions for remote athlete clinical care during and after the COVID-19 pandemic. We define two new terms—eSEM and teleSEM and discuss guiding principles on how to plan for and perform SEM consultations remotely (teleSEM). We provide an example of a generic teleSEM injury assessment guide.

INTRODUCTION

The rapid spread of the COVID-19 pandemic is forcing clinicians to think differently about providing and continuing care to new and existing patients. Many individual clinicians and hospitals implemented telehealth—in some countries (eg, South Africa) only allowed where an established clinician-patient relationship already exists, with some exceptions (psychology or psychiatry services). Although safe, effective and convenient, there are complex challenges to implementing video outpatient consultations in organisations that have not established these processes and health services in a collaborative manner.1

The clinician’s duty of care when discussing specialties is different from that of primary care. The primary care physician usually has a known patient pool, is the first point of contact and has specific duties, such as screening programmes. Some of this is also true for sports medicine (for instance a team physician), but when practising as a specialist and seeing referred patients only, these differences may have ethical implications in the eHealth context. There are examples of eHealth in musculoskeletal physiotherapy and medical specialties, such as ophthalmology, dermatology, radiology, urology, physical medicine and rehabilitation, and orthopaedics.4–14

Sport and exercise medicine (SEM) physicians can learn from these but should also develop and implement their own guiding principles.

AIM

This paper aims to present some guiding principles on how to plan for and perform an SEM consultation remotely (teleSEM) based on a narrative review of the literature. A secondary aim is to develop a generic teleSEM injury assessment guide.

METHODS

We performed a PubMed and Cochrane Library search on 1 June 2020 using a combination of keywords “telemedicine”, “video”, “sports medicine” and “primary care” for PubMed, and “telemedicine” as keyword for the Cochrane Library, and searched for all types of studies written in English and published since 1 January 2015.

WHAT IS EHEALTH: THE CONCEPT AND TERMINOLOGY

eHealth is defined by the WHO as ‘the practice of medicine and public health supported by electronic processes and communication’.15 The Qatar Ministry of Public Health (MOPH) has expanded the WHO definition of eHealth to ‘Transformative and continuous improvement of healthcare through the use of information and technologies that support the delivery of healthcare and clinical research’.16 In summary, it brings together people, processes and health services in a collaborative union with a common goal of improving patient care. ‘Health’ refers to the application of eHealth using mobile devices.17
We define e-Sport-and-Exercise-Medicine (eSEM) as the practice of SEM in athlete and public health contexts supported by electronic processes and communication.

The terms telemedicine and telehealth are commonly used and often applied interchangeably. There is, however, a distinction between the two. In short, all telemedicine is telehealth, but not all telehealth is telemedicine.18–20

Telehealth is a subset of eHealth that includes the delivery of health information, for health professionals and health consumers, education and training of health workers and health systems management through the internet and telecommunications.18–20 Ideally, telehealth is the clinical contact component of a comprehensive, population wide eHealth system, such as the Qatar National eHealth & Data Program (QNeDP) of the MOPH.15

Telemedicine, however, is a subset of telehealth that refers only to the provision of healthcare services and education over a distance, using telecommunications technology.21 Telemedicine involves the use of electronic communications and software to provide clinical services such as diagnosis and patient care without an in-person visit.

We define tele-Sport-and-Exercise-Medicine (teleSEM) as the use of electronic communications and software to provide clinical SEM services such as diagnosis and patient care without an in-person visit. Like telemedicine, teleSEM is an SEM patient service frequently used for follow-up consultations, management of chronic conditions, medication management, specialist consultation and many other clinical services provided remotely via a secure video, audio connections and mobile phone applications.18–20

The teleSEM consultation has three important stages each with its own considerations: (1) planning the consultation, (2) performing the consultation and (3) actions after the consultation (table 1).

IMPLEMENTING A REMOTE CONSULTATION SERVICE IN SEM

Many SEM physicians and sports medicine organisations are rapidly implementing or considering to introduce eSEM and teleSEM services. It is important to ensure approval and licensing by the involved healthcare organisation, as well as security of personal and medical information exchanged on such platforms. SEM physicians, technology suppliers and organisations should codesign these services, ideally involving athletes, coaches and other clinicians involved in clinical services to athletes. The focus of this paper is on the clinical and interactional aspects of a teleSEM service. The organisational and operational aspects that need to be in place to support an effective teleSEM service are vital and complex, but beyond the scope of this paper.

PLANNING A REMOTE CONSULTATION

Establish the need for a remote consultation

The obvious need for a remote clinical consultation exists where a patient needs clinical care but cannot access such a service in person. This might be due to geographical challenges (remote Scotland), safety issues for patient and clinician (war, pandemics), mobility issues (relevant to patient and clinician), or in sports medicine where individual athletes or teams travel to training camps and competitions without medical support staff. It is important to consider what can and what cannot be done in the eHealth context.

Decide on the consultation participants

Clinicians should exercise care when selecting patients for teleSEM consultations. Shaw et al pointed out that such consultations work better when the clinician and patient know and trust each other.22 Furthermore, Donaghy et al stressed that while there are distinct advantages to this type of consultation, patients that require examination or have complex or sensitive problems (eg, disability) should consult in the traditional face-to-face method.23 It may be that the consultation is an initial assessment, but knowledge of the patient’s age,24 ethnicity,25 and gender26 are important factors that should, and invariably are, taken into account in any consultation. TeleSEM providers should be sensitive to a patient’s gender preference of the consulting physician. Research in Saudi Arabia by Alyahya et al demonstrated that this may be the case. Therefore, it may be prudent to ask the patient at the time of making an appointment, whether they do have a preference. Some consultations may require an interpreter or advocate, provided by someone in the room, or remotely, accessed by dial-in, and with suitable introduction to the patient.3 A medical interpreter, a relative or other person who is with the patient can fulfil this role. According to the virtual online consultations: advantages and limitations (VOCAL) study (video consultations in this research), this type of consultation was rated as popular for both patients and staff, although not all staff chose to use it.22

The use of multidisciplinary teams has long been lauded in healthcare, and has countless benefits for all concerned in patient care.28–30 While not all multidisciplinary team members may be available at any one time, many SEM clinical settings will involve a physiotherapist and a sports physician in consultations.

In addition to an interpreter or patient advocate, a physiotherapist might also be present during a teleSEM consultation. The physiotherapist can advise on appropriate interventions before handing back to the clinician for a recap and the conclusion. Any literature or web/YouTube references can be emailed to the patient at the end of the consultation, with the relevant references detailed in the patients’ electronic health record. An

| Table 1 The tele-Sport-and-Exercise-Medicine (teleSEM) process |
|---------------------------------------------------------------|
| Planning the remote consultation | Performing the remote consultation | After the remote consultation |
| ► Establish the need for a remote consultation | ► Have the condition-specific teleSEM guide ready (if you know the type of condition) | ► Accurate and comprehensive notes in the patient’s health record |
| ► Decide on the consultation participants | ► Connect, introduce yourself (and other team members) and confirm the patient’s identity | ► Arrange further investigations, follow-up, referral to other members of the multidisciplinary team (physiotherapist, podiatrist, etc) discharge, urgent hospital admission for further care |
| ► Choose wisely between text, audio or video | ► Perform an initial rapid health status assessment | |
| ► Know the technology | ► Take a history (condition, general, sport, performance goal) | |
| ► Ensure remote access to the electronic health record | ► Perform a remote SEM physical examination | |
| ► Apply ethical guidelines | ► Consider options; discuss a care plan | |
| | ► Decision and actions | |

SEM, sport and exercise medicine.
Box 1 Core ethical principles for healthcare practitioners providing eHealth services, including e-Sport-and-Exercise-Medicine and tele-Sport-and-Exercise-Medicine.

Core ethical principles
► Ensure patient safety
► Use secure and effective communication methods
► Recommend appropriate and practical treatment options
► Ensure that patient feedback mechanisms are in place
► Implement strategies to evaluate and ensure patient satisfaction

Generic and condition-specific quick guides for remote consultations

The COVID-19 challenges are unprecedented, and SEM physicians must be agile and flexible to adapt their traditional clinical assessments. It is reasonable to assume that most patients who present for a telemedicine consultation will at some point require a face-to-face clinical consultation. However, depending on the situation or the condition, this face-to-face meeting does not necessarily have to be the initial consultation. Triage in SEM can in most cases be through teleSEM, based on history alone. In case of uncertainty (and where appropriate), initial special investigations may be arranged, followed by a face-to-face consultation for examination and review of the results. It may even be possible to provide initial advice and a rehabilitation plan, followed later by a face-to-face follow-up consultation. While this is a reversal of the usual steps in clinical assessment, it may be the only reasonable way to provide a service in a ‘lockdown’ or similar situation. Patients will generally understand and appreciate this. Many conditions (such as tendinopathies) are more suitable to this type of consultation, where the physical assessment or imaging add very little additional value to the clinical history.
Similarly, teleSEM is ideal to discuss results following the initial face-to-face clinical consultation in cases where the follow-up would not involve further or a repeated patient examination (eg, where there are no contradictory imaging findings).

Team physicians and physicians who work with a specific cohort of athletes can offer teleSEM for routine athlete health monitoring (in those without any new injury or illness), and other situations where the consultation is mostly a history and results review.

A potential new area of SEM eHealth service is a teleSEM consultation for general health advice, not specific to a particular patient or pathology. In such a consultation, an athlete will engage with an SEM physician and ask one-on-one questions about health issues, without requiring a specific clinical examination.

The teleSEM consultation can be facilitated by condition-specific guidelines based on the generic teleSEM template (Figure 1). TeleSEM is particularly suited for preventative exercise medicine, including exercise advice for health.

eHealth considerations for other sports medicine disciplines and athlete health support services

In addition to specialist SEM physician services, the broader field of sports medicine or athlete healthcare services include several other medical specialties (eg, orthopaedics, cardiology, paediatrics, radiology), team physicians, physiotherapy, sport science services (eg, nutrition and psychology), pharmacy, nursing, dentistry and performance coaching for athletes recovering from injury. These specialties should each develop their eHealth guidelines based on what can and cannot be done in the eHealth context for their specialist field. However, an SEM physician-led team approach to developing eHealth services will facilitate smooth referral pathways and further enhance the patient’s experience. A potentially powerful teleSEM tool is the ‘multidisciplinary consultation’ where a group of practitioners offer a service to the athlete (possibly by using technology that has been designed for online team meetings).

Fee for service considerations

eHealth billing varies widely depending on the involved government’s regulations and policies. Not every government or private care provider provides reimbursement for eHealth services. Services might be free, fully covered by the insurer or the patient, with or without a copayment. It is also possible for certain billing codes not to be covered. These factors contribute to the challenges associated with eHealth services.

THE REMOTE CONSULTATION

The consulting team should be ready to connect with the patient using the agreed eHealth technology at the time of the scheduled appointment, and with full access to the electronic health record and teleSEM condition-specific quick guides (Figure 1).

Connection and introduction

Introduce yourself, check the video and/or audio connection and ask for the patient’s phone number in case the connection fails. Confirm the patient’s identity (name, date of birth, identity (ID) or medical record number). It is important to confirm that the patient is in a comfortable and quiet place and whether they are alone or with someone they trust. It is also important to briefly check if the patient understands the limitations of teleSEM consultation and that they are happy to proceed.

Initial rapid assessment

Do a quick assessment of the patient’s general health status: are they injured/ill or less injured/ill; can they walk? Ask the patient what they want from the consultation. This might include a clinical assessment, reassurance or referral, a certificate or health advice.

History

The teleSEM history-taking structure is similar to a normal face-to-face consultation; a brief history of the current injury/illness, additional history on medication, allergies, previous medical and surgical history, sport performance and training history (recent and past) as well as the patient’s performance goal(s).

The remote sports medicine physical examination

Assess the patient’s physical and mental function as best as you can. Ask the patient: “Where does it hurt? Can you point/show me?”. Observe for colour, swelling, bruising and any obvious deformity. Test the involved and contralateral joint range of movement (active and if possible, passive with the help of a carer/health advocate). Ask the patient if or possible, a third party to
Agreeing on a care plan including shared decision-making

Shared decision-making is not so much a step as it is a way of conducting a consultation. But it is most tangible in the final step of the consultation, agreeing on a care plan. As in a face-to-face consultation, during the teleSEM consultation, the following steps are important:

- Team talk—inform the patient that a choice must be made, that they may consult with significant others and you are there to support them.
- Option talk—discuss the options and communicate the risks and benefits of each.
- Decision talk—listen to the patient to help them go from preferences to informed decisions.

**Decision and action: working diagnosis and red flags**

The working diagnosis and the presence/absence of any red flag symptoms or signs will all determine the treatment plan. This might be further investigations, a follow-up, a referral, discharge with advice or urgent hospital admission for further care.

**AFTER THE CONSULTATION**

Document the teleSEM consultation, including all patient instructions and the agreed care plan, in the electronic health record. Complete the relevant (paper)work for a prescription, a referral for further special investigations, or to another specialist for further treatment.
healthcare provider (physician, physiotherapist, podiatrist). Ensure the appropriate arrangements are in place for a follow-up consultation if required.

EDUCATION AND FUTURE RESEARCH

It is paramount to support and educate all the stakeholders before and in the early stages of implementation—not only on the technology, but also on the clinical SEM service itself.53 54 Excellent evidence-based resources are freely available to support providers, patients and professionals involved in developing and using video consultations.55 Collaborative research is needed on effective implementation of teleSEM services, its effect on patient care (clinical outcomes, quality, safety, satisfaction) and its effect on service providers.

CONCLUSION

SEM physicians must think differently about patient care in a time of COVID-19 and in the changed world after COVID-19. eHealth, eSEM and teleSEM are important parts of this new world. We define eSEM and teleSEM and discuss the guiding principles on how to plan for and perform an SEM consultation remotely, and how to arrange further care, including follow-up consultations. We discuss the importance of multidisciplinary teleSEM consultations and provide an example of a teleSEM injury assessment guide. This will assist the SEM physician to plan and deliver wise eSEM care to their patients.

What is already known

► Telemedicine is a subset of telehealth that refers only to the provision of healthcare services and education over a distance, using telecommunications technology.
► Telemedicine is a clinical service and not a technology.
► Telemedicine is rapidly implemented in practices and hospitals due to the COVID-19 pandemic.
► The organisational and operational aspects that need to be in place to support an effective telemedicine service are vital and complex.

What are the new findings

► It is important for sport and exercise medicine physicians to apply some of the clinical and interventional telemedicine lessons from other medical specialties.
► We define tele-Sport-and-Exercise-Medicine (teleSEM) as the use of electronic communications and software to provide clinical sport and exercise medicine services such as diagnosis and patient care without an in-person visit.
► Sport and exercise medicine physicians can adapt our generic teleSEM injury assessment guide to their own context.

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