


# Telemedicine prehabilitation as a result of COVID-19: disruptive technological solutions

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Dear Editor

Prehabilitation nowadays represents a fundamental component in the preoperative pathway of surgical patients. Optimizing the psychophysical condition of a patient before the surgical procedure, with the aim of enhancing postoperative recovery, has become as important as postoperative rehabilitation<sup>1</sup>. Positive results in terms of reduced morbidity and hospital stay, especially in frail patients, have encouraged surgical teams to realize a prehabilitation scheme in the oncological setting<sup>2,3</sup>. The COVID pandemic has had a strong negative impact on prehabilitation pathways. To limit hospital services solely to essential or urgent ones, non-urgent services have been interrupted, and, among these, all prehabilitation programmes.

To cope with these restrictions, the authors' colorectal surgical team experienced the evolution of a prehabilitation scheme from a standard approach to a telemedicine one, during the course of pandemic year, 2020. A multimodal prehabilitation programme for patients affected by colorectal cancer was introduced in January 2020. The project was launched by the surgical team, with the aim of evaluating its efficacy in terms of postoperative outcomes. Candidates were primarily frail patients, such as elderly people or subjects with low functional reserve. The programme relied on four components: physiotherapy, dietetics, psychological support, and patient blood management. Each aspect was covered fully by hospital specialists and organized in planned sessions twice a week, during the 3–4 weeks before surgical admission. Each patient received a prehabilitation diary, as a tool for home session exercises, and a food diary. Patients' caregivers were strongly invited to take part in the prehabilitation programme, not only to provide practical assistance but also as part of the patients' preoperative preparation.

After the springtime lockdown, prehabilitation programme modalities changed. A remote prehabilitation format was developed for a 6-month period. It was based on telephone

counselling and home delivery of the prehabilitation diary, with the aim of promoting physical activity and correcting dietary deficiencies. Psychological activity was affected negatively during this period. With the new strong wave of the epidemic occurring in October, the prehabilitation project changed format again, and was remodelled into a telemedicine approach.

Telemedicine is defined by the WHO as delivery of healthcare services, where patients and providers are separated by distance. It was introduced more than 40 years ago. It enabled hospital professionals to communicate with patients living in remote areas or with mobility limitations<sup>4</sup>. Its applications cover a broad range of medical services, such as monitoring of cardiac patients or oncological follow-up visits<sup>5</sup>. E-mail, smartphones or other wireless systems can be used as supply devices. Telemedicine has grown rapidly, especially in recent months. The prehabilitation programme here was restored by tele-prehabilitation. The key point is represented by video calls, realized through a simple network programme. The tele-prehabilitation programme is summarized in [Table 1](#). Patient blood management was substituted by standard oral iron supplementation. In this preliminary experience, the programme was shown to be feasible and was highly appreciated by the patients. Presence of a caregiver was fundamental for home-session activities.

This experience represents a valid example of rearrangement of a patient-care modality after the COVID outbreak. In any crisis periods, clinicians aim to turn difficulties into opportunities and create a resilient organization. The restrictions imposed by social distancing pushed the authors to re-engineer the prehabilitation programme, and identify a new format that could also be useful in the future. Although prehabilitation is not included among essential services, the authors believe it is particularly important, especially in difficult settings. This model could create the opportunity for future developments in tele-prehabilitation, and for application of telemedicine in other surgical contexts, such as oncological follow-up.

Table 1 Tele-prehabilitation calendar

	Activity	Where	When (hours)		Activity	Where	When (hours)
<b>Week 1</b>				<b>Week 3</b>			
Monday				Monday			
Tuesday	Physiotherapy*	Hospital	10.00	Tuesday	Dietician <sup>§</sup>	Home	12.30
	Dietician	Hospital	12.20		Physiotherapy <sup>†</sup>	Home	14.00
Wednesday				Wednesday			
Thursday	Psychologist	Hospital	14.00	Thursday	Psychologist <sup>‡</sup>	Home	15.00
Friday	Physiotherapy <sup>†</sup>	Home	14.00	Friday	Physiotherapy <sup>†</sup>	Home	14.00
<b>Week 2</b>				<b>Week 4</b>			
Monday				Monday			
Tuesday	Physiotherapy <sup>†</sup>	Home	14.00	Tuesday	Physiotherapy <sup>†</sup>	Home	14.00
Wednesday				Wednesday			
Thursday	Psychologist <sup>‡</sup>	Home	15.00	Thursday	Psychologist <sup>‡</sup>	Home	15.00
Friday	Physiotherapy <sup>†</sup>	Home	14.00	Friday	Physiotherapy <sup>†</sup>	Home	14.00

\*Specialist in-presence evaluation; physiotherapist introduces homework and pedometer use, and provides prehabilitation agenda. <sup>†</sup>Personalized physical exercise sessions, in presence of caregiver. <sup>‡</sup>Individual or small-group video call. <sup>§</sup>Dietician checks bodyweight trend and food diary.

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