



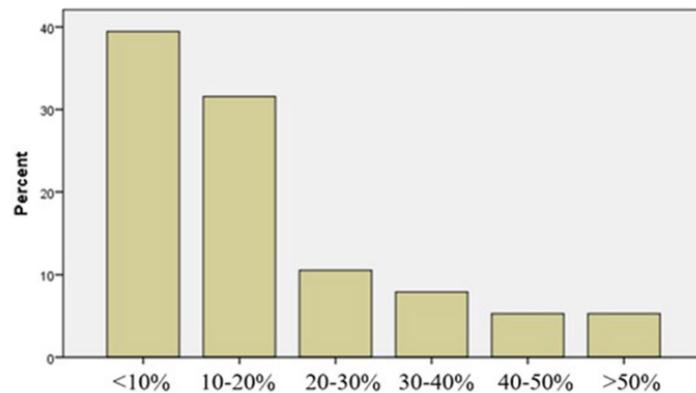
RESEARCH

Open Access

# Opportunities and barriers for telemedicine in pain management: insights from a SIAARTI survey among Italian pain physicians



Marco Cascella<sup>1</sup>, Massimo Antonio Innamorato<sup>2</sup>, Silvia Natoli<sup>3,11\*</sup>, Valentina Bellini<sup>4</sup>, Ornella Piazza<sup>1</sup>, Roberto Pedone<sup>5</sup>, Antonino Giarratano<sup>6,7</sup>, Franco Marinangeli<sup>8</sup>, Luca Miceli<sup>9</sup>, Elena Giovanna Bignami<sup>4</sup> and Alessandro Vittori<sup>10</sup>



**Fig. 3** Impact of telemedicine use on service delivery in pain medicine



**Fig. 2** Regional distribution of telemedicine-based pain management centers



Review

# Open Issues and Practical Suggestions for Telemedicine in Chronic Pain

Marco Cascella <sup>1</sup>, Franco Marinangeli <sup>2</sup>, Alessandro Vittori <sup>3,\*</sup>, Cristina Scala <sup>4</sup>, Massimo Piccinini <sup>5</sup>,  
Alessandro Braga <sup>6</sup>, Luca Miceli <sup>7</sup> and Renato Vellucci <sup>8</sup>

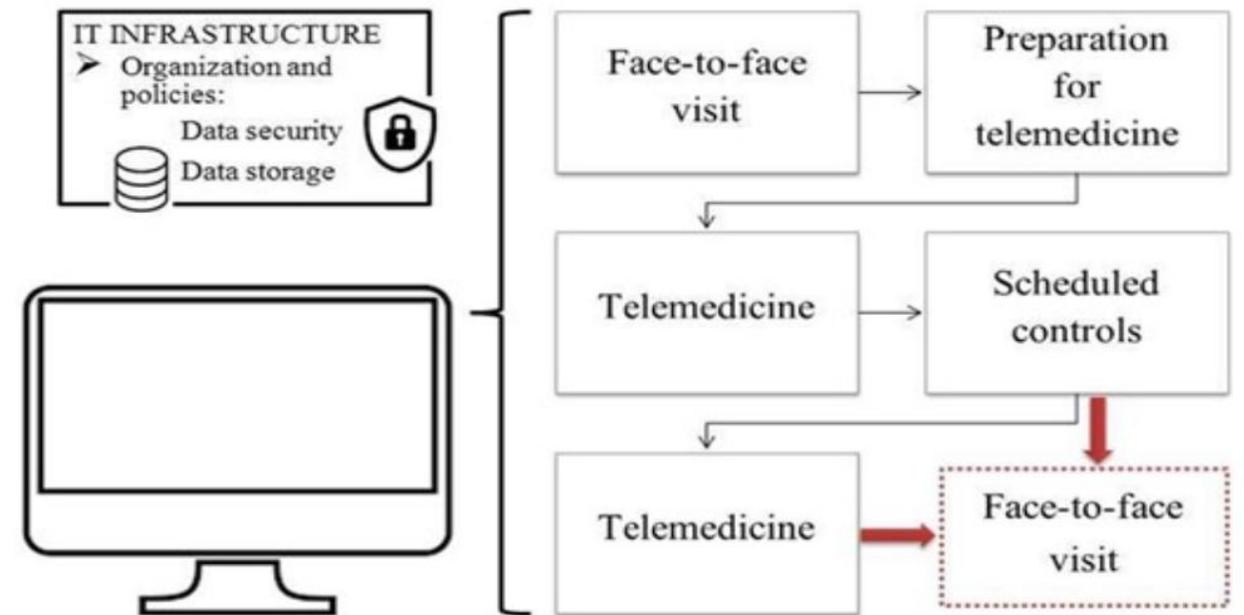


Figure 1. Telemedicine pathway for addressing chronic pain.



# Doctor@Home: Through a Telemedicine Co-production and Co-learning Journey

Luca Miceli<sup>1</sup> · Francesca Dal Mas<sup>2,3</sup> · Helena Biancuzzi<sup>3</sup> · Rym Bednarova<sup>4</sup> · Alessandro Rizzardo<sup>5</sup> · Lorenzo Cobianchi<sup>6,7</sup>  · Eric S. Holmboe<sup>8,9,10</sup>

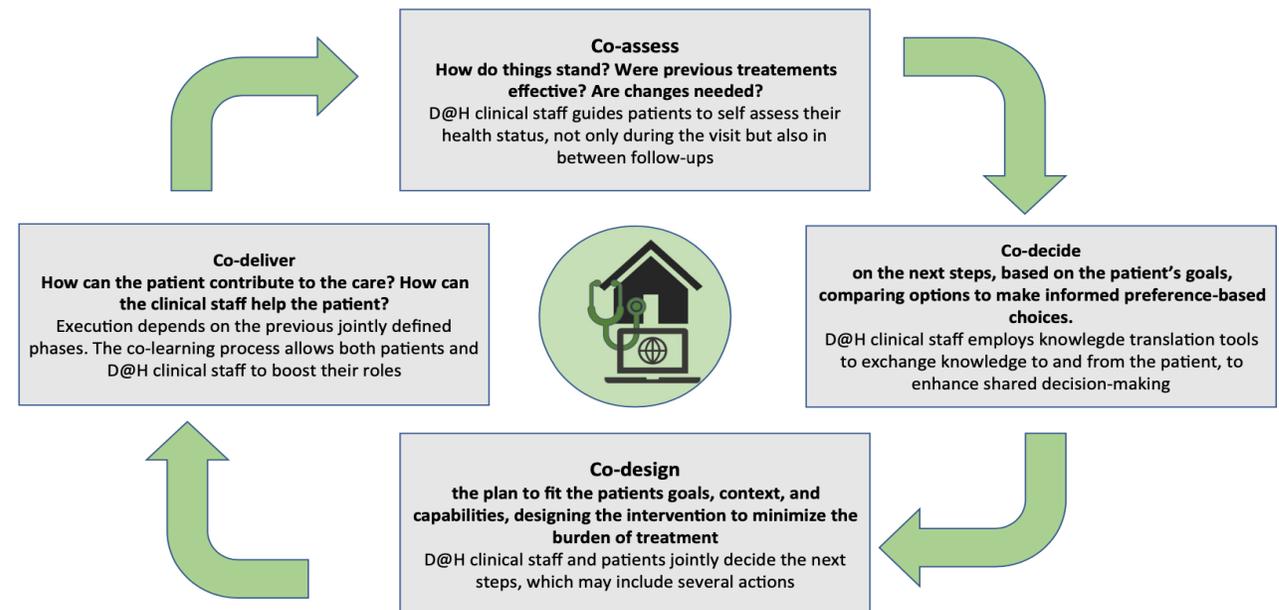


Fig. 1 D@H co-production and co-learning cycle. The framework is adapted from Elwyn et al. [11]

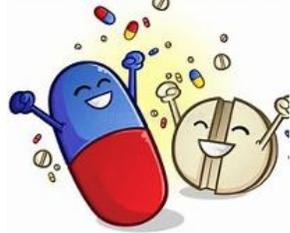
# PERCORSO INTEGRATO DEL PAZIENTE: TRA ALGOLOGO E RIABILITATORE

## Insegnamento



Oppiacei, adiuvanti, nutraceutica

Farmaci



Terapie mini invasive ambulatoriali

Terapie infiltrative



Fisioterapia



Terapie fisiche, terapie manuali, esercizio terapeutico





“

Misura ciò che è misurabile, e rendi misurabile ciò che non lo è.

GALILEO GALILEI



Front Back Sagittal District Face

	Side	Description
E1	<input checked="" type="checkbox"/> Right	Tibialis anterior
E2	<input checked="" type="checkbox"/> Right	Gastrocnemius medialis
E3	<input checked="" type="checkbox"/> Left	Tibialis anterior
E4	<input checked="" type="checkbox"/> Left	Gastrocnemius medialis

Front Back Sagittal District Face

Le tecnologie avanzate per l'analisi del movimento

$$F = G \frac{m_1 m_2}{d^2}$$

L'atleta come prototipo prestazionale  
per il paziente

$$\frac{\partial^2 u}{\partial t^2} = c^2 \frac{\partial^2 u}{\partial x^2}$$

$$\frac{df}{dt} = \lim_{h \rightarrow 0} \frac{f(t+h) - f(t)}{h}$$

## Il pattinaggio corsa a rotelle: perché proprio questa disciplina?

- Ripetitività del gesto
- Arti inferiori più semplici da studiare rispetto alla spalla
- Attivazioni e coattivazioni più nette
- Richiede forza, resistenza, equilibrio, coordinazione
- Fasi simmetriche (rettilinei) e fasi asimmetriche (curve)
- Modello prestazionale «in house»



Check for updates

**OPEN ACCESS**  
EDITED BY  
Dustin A. Cronin,  
Auckland University of Technology,  
New Zealand  
REVIEWED BY  
Alessia Michalini,  
Eugenio Medea (IRCCS), Italy  
Marcelo Sacconi,  
Caf Fendello Hospital, Italy  
\*CORRESPONDENCE  
Luca Miceli  
luca.miceli@univr.it

## Evaluation of muscle energy in isometric maintenance as an index of muscle fatigue in roller speed skating

Giulia Bongiorno<sup>1</sup>, Helena Biancuzzi<sup>2\*</sup>, Francesca Dal Mas<sup>3</sup> and Luca Miceli<sup>1\*</sup>

<sup>1</sup>Roller Rehabilitation Center, Rovereto in Piano (RN), Italy, <sup>2</sup>Department of Pain Medicine, IRCCS G.O. National Cancer Institute of Aviano, Aviano, Italy, <sup>3</sup>Department of Management, Ca' Foscari University of Venice, Venice, Italy

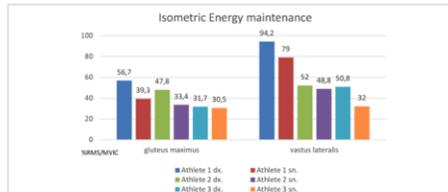


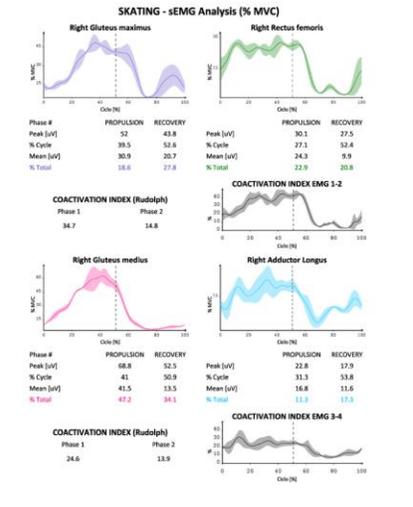
FIGURE 1 | % EMG/MVC (in ordinate, y axis) in the three athletes studied, right side and left side for the two investigated muscles.  $W = 0$  with  $p < 0.05$  for Wilcoxon test.

## Le pubblicazioni scientifiche in ambito sportivo

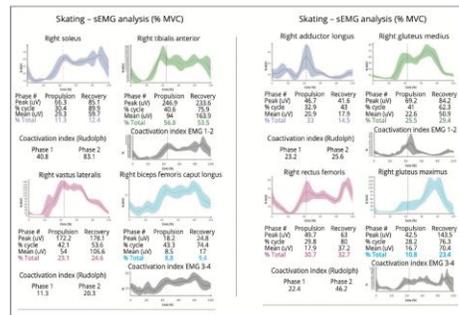


### Case Report Roller Speed Skating Kinematics and Electromyographic Analysis: A Methodological Approach

Giulia Bongiorno<sup>1</sup>, Helena Biancuzzi<sup>2\*</sup>, Francesca Dal Mas<sup>3</sup>, Giuseppe Fasano<sup>4</sup> and Luca Miceli<sup>1</sup>



## EMG surface analysis in short track in line speed skating athletes: the curve after the straight



## Artificial intelligence as a potential teaching tool for athletes: when the skate and the smartphone run together

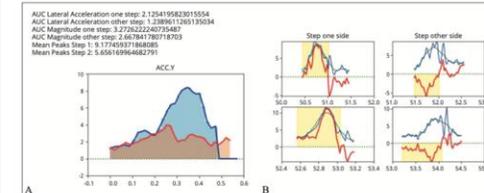


Figure 2—A) Representation of the average lateral acceleration/time curve on the right leg compared to the left leg. B) graphical representation of the automatic analysis of the curves (dark gray area, yellow in the online version) to extrapolate the ACCY (area under the curve).

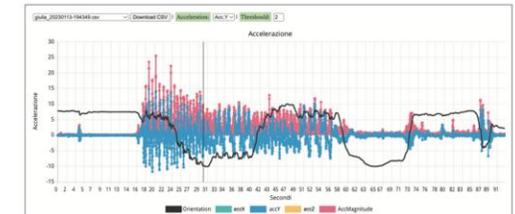
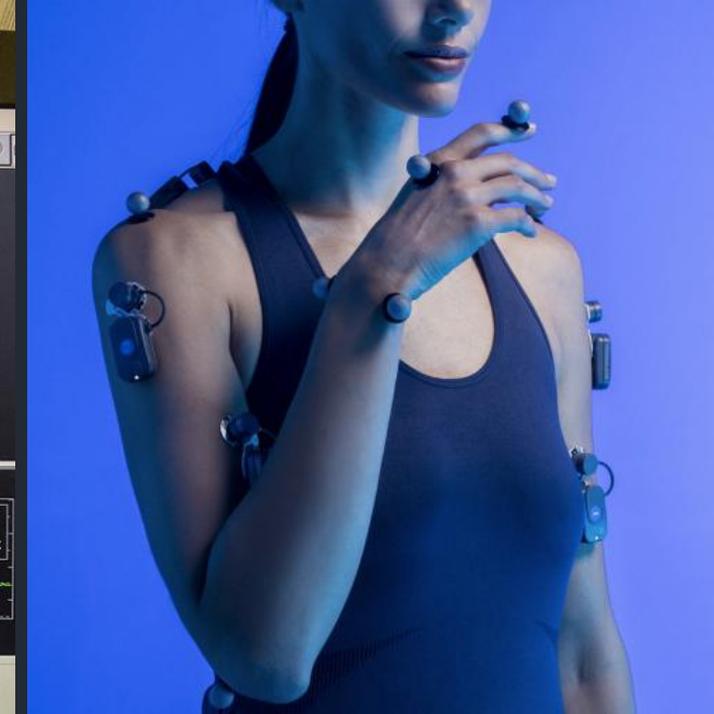
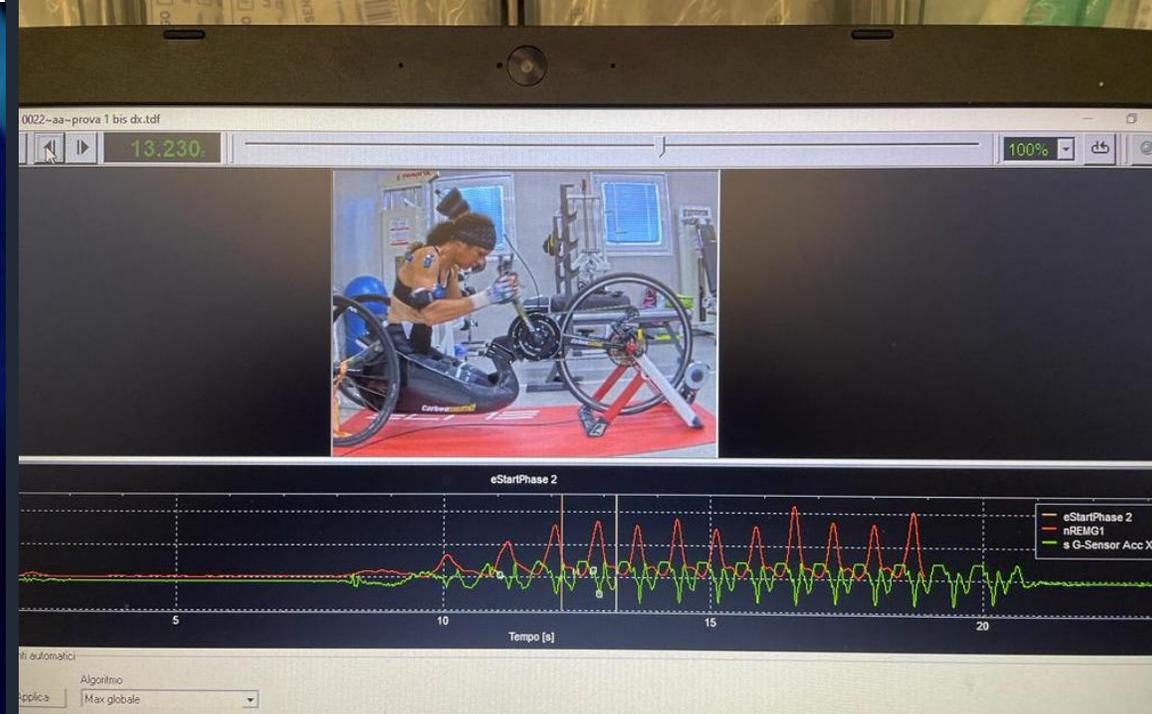
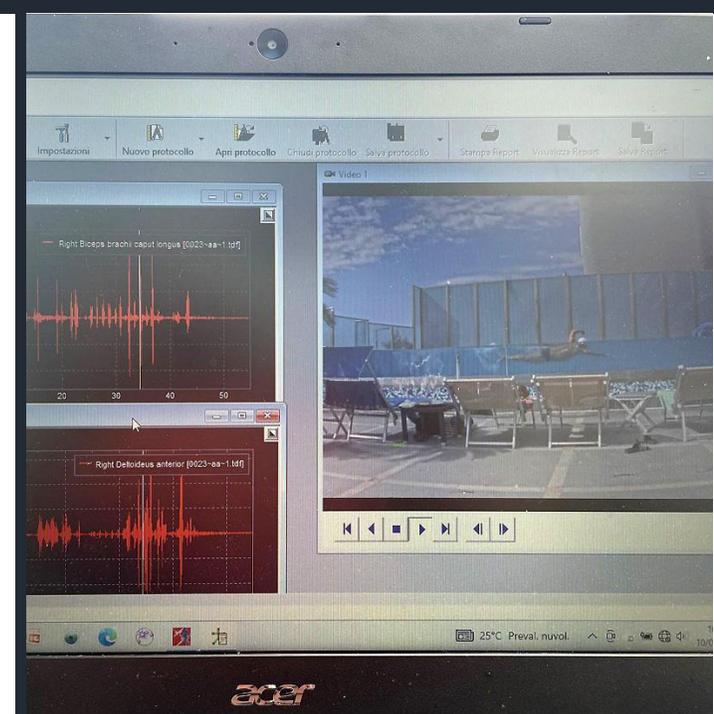


Figure 1—Graphic representation, during a lap of the skating risk (length 200 m), of magnitude (light gray line; pink in the online version), lateral acceleration (dark gray line; blue in the online version), orientation (black line). The two horizontal sections of the orientation parameter represent straight lines; the slopes identify the curves.

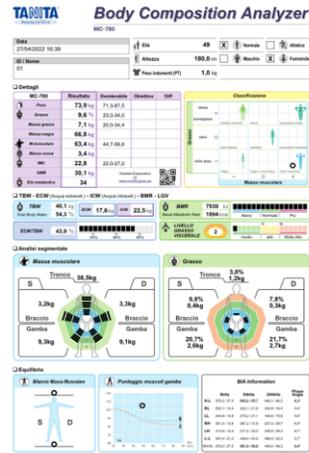


La spalla nelle sue declinazioni (patologia di spalla, atleti, paratleti, senologia)



### Physical Activity in Oncology: To Do, Not to Do, and How to Do It? An Announcement of an Educational Program

Helena Biancuzzi<sup>1</sup> · Francesca Dal Mas<sup>2</sup> · Giulia Bongiorno<sup>3</sup> · Rym Bednarova<sup>4</sup> · Luca Miceli<sup>1</sup>



CORRESPONDENCE

Open Access

### Pulsed radiofrequency on peripheral nerve as a rehabilitation aid

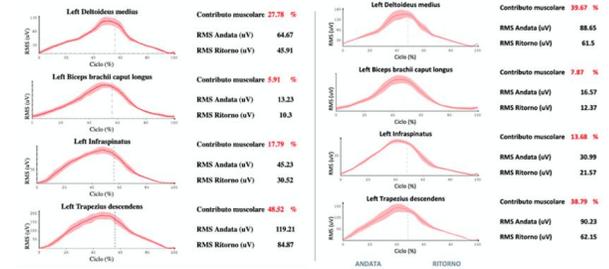
Giulia Bongiorno<sup>1</sup>, Helena Biancuzzi<sup>2</sup>, Francesca Dal Mas<sup>3,4</sup>, Rym Bednarova<sup>5</sup>, Alessandro Vittori<sup>6</sup> and Luca Miceli<sup>7</sup>



**Fig. 1** Example of placement of surface electromyographic probes on the rectus femoris muscles, connected to a PC in wireless mode

### Case Report Pulsed Radiofrequency as a Standalone Treatment for Adhesive Capsulitis

Giulia Bongiorno<sup>1</sup>, Rym Bednarova<sup>2</sup>, Helena Biancuzzi<sup>3</sup>, Francesca Dal Mas<sup>4</sup>, Alessandro Rizzardo<sup>5</sup>, Andrea Tomasi<sup>5</sup>, Giulio Edoardo Vigni<sup>5</sup> and Luca Miceli<sup>6,\*</sup>



### The Rehabilitation Tailor: Applying Personalized Medicine to Cancer Recovery

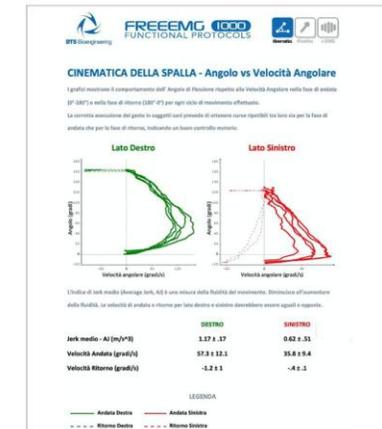
Giulia Bongiorno<sup>1</sup>, Helena Biancuzzi<sup>2</sup>, Francesca Dal Mas<sup>3</sup>, Rym Bednarova<sup>4</sup> and Luca Miceli<sup>7</sup>

<sup>1</sup>First Rehabilitation Research in Tumor Site, \*First Medicine, IRCCS National Cancer Institute of Aviano, Aviano, Italy; <sup>2</sup>Department of Management, Ca' Foscari University of Venice, Venice, Italy; <sup>3</sup>First Medicine, Hospital of Latisana, Latisana, Italy

Keywords: cancer rehabilitation, physiotherapy, breast cancer, fitness activity, women



**FIGURE 1** Path for the creation of PRER for patients after breast surgery for whom the need for a rehabilitation process is recognized.



**FIGURE 1** The graphs show the kinematics of the shoulder angle concerning the angular velocity in the andata and return phases for each cycle of movement performed. The correct kinematics of the shoulder health system provides repeatable curves for both the andata and return phases, indicating good motor control.



OPEN ACCESS

EDITED BY  
Simone Carozzo,  
Sant'Anna Crotona Institute, Italy

REVIEWED BY  
Cigdem Ayhan Kuru,  
Hacettepe University, Türkiye  
Sabba Mehmood,  
National University of Medical Sciences  
(NUMS), Pakistan

\*CORRESPONDENCE  
Luca Miceli  
✉ luca.miceli@cro.it

RECEIVED 03 August 2023  
ACCEPTED 27 December 2023  
PUBLISHED 23 January 2024

CITATION  
Bongiorno G, Tomasi A, Vigni G, Rizzardo A,  
Biancuzzi H, Dal Mas F, Bednarova R and  
Miceli L (2024) Case report: Movement  
analysis in oncological rehabilitation:

# Case report: Movement analysis in oncological rehabilitation: proposal of a kinematic and surface electromyographic protocol in breast oncology

Giulia Bongiorno<sup>1</sup>, Andrea Tomasi<sup>2</sup>, Giulio Vigni<sup>2</sup>,  
Alessandro Rizzardo<sup>2</sup>, Helena Biancuzzi<sup>3</sup>, Francesca Dal Mas<sup>4,5</sup>,  
Rym Bednarova<sup>6</sup> and Luca Miceli<sup>7\*</sup>

<sup>1</sup>Friuli Riabilitazione Rehabilitation Center, Roveredo in Piano (PN), Italy, <sup>2</sup>Papa Giovanni XXIII Hospital, Monastier (TV), Italy, <sup>3</sup>Department of Economics, Ca Foscari University of Venice, Venice, Italy, <sup>4</sup>Department of Management, Ca Foscari University of Venice, Venice, Italy, <sup>5</sup>Collegium Medicum University of Social Sciences, Łódź, Poland, <sup>6</sup>Pain Medicine, Hospital of Latisana (UD), Latisana, Italy, <sup>7</sup>Centro di Riferimento Oncologico di Aviano (CRO) IRCCS, Aviano (PN), Italy



FIGURE 1  
Performing pulsed radiofrequency treatment of the left suprascapular nerve (photograph obtained with the consent of the portrayed subject).



FIGURE 2  
Example of positioning of the electromyographic probes (photograph obtained with the consent of the portrayed subject).



## Vantaggi della telemedicina

- Maggiore confort per il paziente
- Minori oneri organizzativi per i trasporti
- Minore inquinamento
- Minori rischi infettivi (es. pazienti immunodepressi)
- Personalizzazione delle cure



Quarzie

