

Safety in the use of ultrasound in rheumatology during the COVID-19 Pandemic. Spanish Society of Rheumatology positioning paper.

Title: Safety in the use of ultrasound in rheumatology during the COVID-19 Pandemic. Spanish Society of Rheumatology positioning paper.

Publication year: 2021

Journal: Reumatología clínica

Authors: Servicio de Reumatología, Hospital Universitario de Valme, Sevilla, España. Electronic address: lucia.mayordomo@gmail.com.

Society: European Respiratory Society

Origin country: International (Europe)

Target countries: Europe

DOI: 10.1016/j.reuma.2020.10.010

PMID: 33376052

Source: <https://pubmed.ncbi.nlm.nih.gov/33376052/>

Reumatol Clin (Engl Ed) 3815 pheelsevier 101717526 Reumatología Clínica 2173-5743
pmc-is-collection-domain yes pmc-collection-title Elsevier - PMC COVID-19 Collection
PMC7983453 PMC7983453.1 7983453 7983453 33376052 10.1016/j.reumae.2021.03.001
S2173-5743(21)00064-2 1 Consensus Statement Safety in the use of ultrasound in rheumatology during the COVID-19 pandemic. Spanish Society of Rheumatology positioning paper ■ Seguridad en el uso de la ecografía en reumatología durante la pandemia COVID-19. Documento de posicionamiento de la Sociedad Española de Reumatología Mayordomo Lucía a * Collada Juan Molina b Hernández Félix M. Francisco c Bueno Ángel d Insua Vilariño Santos A. e Jiménez-Núñez Francisco Gabriel f Martínez Pérez Rosalía g Möller Ingrid h Usón Jaeger Jacqueline i García-Llorente José Francisco j Álvaro-Gracia José M. b Aparicio Ruiz Eduardo k Asaro Daverio Liliana l Naredo Esperanza m Grupo de Trabajo de Ecografía de la Sociedad Española de Reumatología (ECOSER) a Servicio de Reumatología, Hospital Universitario de Valme, Sevilla, Spain b Servicio de Reumatología, Hospital General Universitario Gregorio Marañón, Madrid, Spain. Instituto de Investigación Sanitaria Gregorio Marañón, Madrid, Spain c Servicio de Reumatología, Hospital Universitario de Gran Canaria Dr. Negrín, Gran Canaria, Spain d Servicio de Radiología musculoesquelética, Hospital Universitario Fundación Alcorcón, Madrid, Spain e Servicio de Reumatología, Complejo Hospitalario Universitario Santiago de Compostela, Santiago de Compostela, Spain f Unidad Gestión Clínica Reumatología, Hospital Regional Universitario de Málaga, Spain. Unidad Gestión Clínica Reumatología, Hospital Civil, Málaga, Spain g Servicio de Reumatología, Hospital Universitario Virgen del Rocío, Sevilla, Spain h Instituto Poal de Reumatología, Barcelona, Spain. Universidad de Barcelona, Barcelona, Spain i Servicio de Reumatología, Hospital Universitario de Móstoles, Madrid, Spain j Servicio de Reumatología, Hospital de Galdakao, Vizcaya, Spain k Ultrasonidos, General Electric Healthcare, Madrid, Spain l Aplicaciones, Samsung Electronics Iberia, Madrid, Spain m Servicio de Reumatología, Hospital Universitario Fundación Jiménez Díaz, Madrid, Spain ■ Corresponding author. 5 2021 22 3 2021 17 5 378033 284 289 22 9 2020 29 10 2020 22 03 2021 23 03 2021 08 08 2024 © 2020 Elsevier España, S.L.U. and Sociedad Española de Reumatología y Colegio Mexicano de Reumatología. All rights reserved. 2020 Elsevier España, S.L.U. and Sociedad Española de Reumatología y Colegio Mexicano de Reumatología Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website. Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19

resource centre remains active. Ultrasound is a widely implemented imaging modality in rheumatology practice that implies a great interaction between patient and professional. The COVID-19 pandemic requires a change in our clinical practice, through the adoption of new strategies that allow comprehensive care for our patients, guaranteeing the safety of both patients and healthcare professionals.

Our objective was to develop practical recommendations, agreed among a panel of experts, on the use and safety of rheumatological ultrasound during the COVID-19 pandemic.

We performed a narrative review of the available literature. Based on the literature review, we produced preliminary recommendations that were subsequently agreed among a panel of experts using the Delphi methodology with a 1–5 Likert scale. Agreement for each recommendation was considered if 75% of the panel members scored the item ≥ 4 on the Likert scale.

5 overarching principles and 28 recommendations were issued and agreed among the panel. Group consensus was achieved in 100% of items.

The document provides useful information about preventive measures in the practice of ultrasound in rheumatology in times of a COVID-19 pandemic based on the experience and literature available to date.

La ecografía es una técnica de amplia implantación en reumatología que implica una gran interacción entre paciente y profesional. La pandemia COVID-19 hace necesario un cambio en nuestra práctica clínica, mediante estrategias que permitan la asistencia integral de nuestros pacientes, garantizando la seguridad tanto de los pacientes como de los profesionales sanitarios.

Desarrollar unas recomendaciones prácticas, consensuadas entre un panel de expertos, sobre el uso y seguridad de la ecografía reumatológica durante la pandemia COVID-19.

Analizando la literatura disponible se realizaron unas recomendaciones preliminares, posteriormente consensuadas con un panel de expertos mediante el método Delphi con una escala Likert 1–5.

Se elaboraron y consensuaron por el panel 5 principios fundamentales y 28 recomendaciones. El consenso del grupo se logró en el 100% de ítems (acuerdo para cada recomendación ≥ 4 en escala de Likert del 75% de componentes del panel).

El documento proporciona información de utilidad acerca de medidas preventivas en la práctica de ecografía en reumatología en tiempos de pandemia COVID-19 de acuerdo a la experiencia y literatura disponible hasta el momento.

Since its emergence in December 2019, the COVID-19 epidemic, caused by the new SARS-CoV-2 coronavirus, rapidly spread to become a global pandemic. 1 This exceptional situation calls for a change in our daily clinical practice towards new comprehensive care strategies, to ensure the safety of patients and healthcare professionals. 2

Ultrasound, an imaging modality widely used in rheumatology practice, is a technique in which there is high interaction between doctor and patient. This is a great advantage as it allows real-time visualisation of the structure to be explored and interactive dialogue with the patient. However, during the COVID-19 pandemic, this positive healthcare aspect of ultrasound has become a potential risk factor for the transmission of infection. In a study by Wang et al. conducted in Wuhan, the epicentre of the pandemic, the rate of COVID-19 infection in sonographers was approximately 3.4%, considerably higher than the overall infection rate among healthcare workers (2.2%) of any specialty. 2, 3 Therefore, special recommendations to ensure safety during this examination are essential. Specific recommendations and guidelines have already been published to reduce the risk

of exposure of radiology staff involved in the diagnosis of patients with COVID-19 in other areas, such as CT and plain radiology. 4 , 5

The Spanish Society of Rheumatology (SER) recently published a positioning paper on the operation and re-establishing of rheumatology service activity in light of COVID-19, 6 setting out general and specific safety measures for patients and professionals. Although ultrasound is practiced widely in most rheumatology departments in Spain, it is only mentioned in recommendation 6, with a 71% level of agreement, which states: " If specific techniques (arthrocentesis, infiltration, ultrasound, capillaroscopy) need to be performed, an FFP2 type mask, facial protection (goggles or face shield) and body protection with scrubs, gloves and closed footwear must be worn ". However, they provide no specific recommendations for patients and professionals for performing ultrasounds, nor information on disinfecting ultrasound equipment.

To develop practical recommendations, agreed by a panel of experts, on the use and safety of rheumatological ultrasound during the COVID-19 pandemic.

The methodology of this work comprised the following consecutive phases: - Selection by the scientific coordinators (EN, LM) and the Internal Affairs Committee of the SER of a panel of 14 specialists in rheumatology, radiology and technology, experts, and users of ultrasound of the locomotor system and with geographical distribution in Spain.

Narrative literature review (JMC, FMFH).

A literature review was carried out in PubMed and Embase up to 1/6/2020 using the keywords "ultrasound OR echography OR sonography" AND "viral infection OR viral transmission OR SARS OR coronavirus" AND "security measures OR risk assessment OR security", and their respective synonyms in MeSH and free terms, and excluding other viral infections (hepatitis, CMV, papillomavirus). We also searched for information on websites for recommendations or guidelines from the main national and international Scientific Societies of Radiology and Ultrasound on mode of action and safety during the COVID-19 pandemic, as well as the recommendations of the main commercial ultrasound companies on the use and maintenance of the ultrasound scanner and its elements to avoid transmitting infections without damaging the equipment. - Distribution of the results of the narrative literature search among the panel members, working in pairs, who were assigned a section of the project content.

The sections were as follows: (A) Overarching principles; (B) Indication for rheumatological ultrasound during the COVID-19 pandemic; (C) Screening, patient referral and patient flow; (D) Patient reception and preparation; (E) Performance of ultrasound and protective measures for patients and healthcare professionals; (F) Protection, cleaning, and disinfection of ultrasound equipment; (G) Ultrasound-guided interventions. - Development of the preliminary recommendations by the panel.

Supervision of the preliminary recommendations by the scientific and methodological coordinators.

Proposal for agreement of the resulting recommendations to all panel members using the Delphi method, applied telematically, with the necessary rounds to reach consensus of the group, after reformulating or reconsidering each recommendation in the event of disagreement. Panel consensus was considered when 75% of the panel members scored their agreement with each recommendation ≥ 4 on a Likert scale of 1–5 (1. strongly disagree; 2. strongly disagree; 3. neither agree nor disagree; 4. strongly agree; 5. strongly agree).

There are no publications to date that establish specific safety recommendations for the use of ultrasound in rheumatology during the COVID-19 pandemic. Therefore, information related to this field was extracted from recommendations of national or international societies of ultrasound and radiology, for the most part.

We analysed 30 references that fully or partially met the objectives of the review, as well as their literature citations. With the results obtained 3 , 6 , 7 , 8 , 9 , 10 , 11 , 12 , 13 , 14 , 15 , 16 , 17 , 18 , 19 , 20 , 21 , 22 , 23 , 24 , 25 a narrative document on safety in the use of ultrasound was drafted and presented to the expert panel for discussion and consensus.

All the panel members answered the two rounds of the Delphi questionnaire. Five overarching principles and 28 recommendations were developed and agreed upon by the panel, as shown in the respective tables in Table 1 . Panel consensus was achieved with only one Delphi round. However, there was strong disagreement on two recommendations by some members of the panel, which were therefore reformulated and resubmitted for agreement, together with those originally agreed by the group using a Likert scale of 1–5 and a simple vote between the two, in a second Delphi round; the versions of the two recommendations that were agreed by the panel and, if both alternatives were agreed, the version that received the most votes from the panel members, were chosen as the final recommendations. Table 1 Overarching principles and safety recommendations on the use of ultrasound in rheumatology during the COVID-19 pandemic.

These recommendations refer to preventive measures during the COVID-19 pandemic when using ultrasound, a technique widely used in rheumatology practice. However, they could apply to other rheumatological techniques where there is close contact with the patient and a vehicle of transmission (gel or oil) is used, as in the case of capillaroscopy or where there is the possibility of contact with biological fluids (arthrocentesis or infiltrations, not necessarily ultrasound guided). These recommendations should be adaptable and dynamic depending on the circumstances of the setting and course of the pandemic, prioritising the maximum protection of patient and professional to ensure the optimum quality of the test. Each health service and teaching department could consider adapting their ultrasound teaching, which is so important for our rheumatological society and necessarily affected in the interest of safety, to the epidemiological circumstances of the pandemic.

This document provides useful information on preventive measures in rheumatology ultrasound practice during the COVID-19 pandemic based on the experience and literature available to date. The COVID-19 pandemic poses a challenge in our routine rheumatological ultrasound practice. With a high level of agreement, the panel of experts proposed recommendations that, adapted to the availability of resources, will help in the safe planning and performing of necessary ultrasound examinations for patients and professionals, and minimise the risk of transmission of infection without undermining the diagnostic quality of the test.

The authors have no conflict of interests to declare.

Zhu N. Zhang D. Wang W. Li X. Yang B. Song J. A novel coronavirus from patients with pneumonia in China, 2019 *N Engl J Med* 382 2020 727 733 31978945 10.1056/NEJMoa2001017 PMC7092803
2 Zhang S. Wang Z. Chang R. Wang H. Ch Xu Yu X. COVID-19 containment: China provides important lessons for global response *Front Med* 25 2020 1 5 10.1007/s11684-020-0766-9 PMC7095399 32212059
3 Abramowicz J.S. Basseal J.M. Brezinka C. Dall'Asta A. Deng J. Harrison G. ISUOG Safety Committee Position Statement on use of personal protective equipment and hazard mitigation in relation to SARS-CoV-2 for practitioners undertaking obstetric and gynecological ultrasound *Ultrasound Obstet Gynecol* 55 2020 886 891 10.1002/uog.22035 Available from: <https://www.isuog.org/uploads/assets/b8dde768-08a2-424c-a4615551637515e9/ISUOG-Safety-Committee-statement-on-COVID19-and-PPE.pdf> 32255535 PMC7262197
4 Zhao Y. Xiang C. Wang S. Peng C. Zou Q. Hu J. Radiology department strategies to protect radiologic technologists against COVID19: experience from Wuhan *Eur J Radiol* 127 2020 108996 32344294 10.1016/j.ejrad.2020.108996 PMC7194837
5 Nakajima K. Kato H. Yamashiro T. Izumi T. Takeuchi I. Nakajima H. COVID-19 pneumonia: infection control protocol inside computed tomography suites *Jpn J Radiol* 38 2020 391 393 32185669 10.1007/s11604-020-00948-y PMC7089199
6 Documento de posicionamiento de la sociedad española de reumatología sobre funcionamiento y restablecimiento de la actividad de los servicios de reumatología ante la COVID-19. [Accessed 28

May 2020]. Available from:

<https://www.ser.es/wp-content/uploads/2020/05/POSICIONAMIENTO-COVID19.pdf> . 7 World Federation for Ultrasound in Medicine and Biology Safety Committee (Abramowicz JS, Akiyama I, Evans D, Fowlkes JB, Marsal K, Sayeed Y and Haar GT), Abramowicz JS, Basseal JM. World Federation for Ultrasound in Medicine and Biology Position Statement: how to perform a safe ultrasound examination and clean equipment in the context of COVID-19. *Ultrasound Med Biol*. 2020;46:1821–6. 10.1016/j.ultrasmedbio.2020.03.033 PMC7129041 32327199 8 CDC Coronavirus disease 2019 (COVID-19) [Accessed 24 May 2020]. Available from: Centers for Disease Control and Prevention <https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-hcf.html> 2020 9 US EPA O List N: disinfectants for use against SARS-CoV-2 [Accessed 22 May 2020]. Available from: US EPA <https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2> 2020 10 SIRM, SIUMB and FISM guidelines on behavioral modalities for carrying out an ultrasound examination in this pandemic moment. [Accessed 22 May 2020]. Available from: <https://www.raggix.eu/snr/modalita-di-comportamento-per-leffettuazione-di-un-esame-ecografico-24-marzo-2020/> . 11 Esaote ultrasound probes cleaning and disinfection in the event of COVID-19 emergency. Esaote. [Accessed 22 May 2020]. Available from: <https://www.esaote.com/es-ES/special-covid-19/our-solutions/esaote-ultrasound-probes-cleaning-and-disinfection-in-the-event-of-covid-19-emergency/> . 12 Recomendaciones SEUS para la realización de ecografías durante la pandemia de COVID-19 medidas de seguridad. [Accessed 22 May 2020]. Available from: <http://www.seus.org/publicaciones-documentos-seus.html> . 13 Decálogo SEUS de recomendaciones para la exploración ecográfica de pacientes teóricamente no infectados durante la epidemia COVID-19. [Accessed 29 April 2020]. Available from: <http://www.seus.org/publicaciones-documentos-seus.html> . 14 Kampf G. Todt D. Pfaender S. Steinmann E. Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents *J Hosp Infect* 104 2020 246 251 32563551 10.1016/j.jhin.2020.06.001 PMC7834866 15 Henwood A.F. Coronavirus disinfection in histopathology *J Histotechnol* 2020 1 3 10.1080/01478885.2020.1734718 32116147 16 Duan S.-M. Zhao X.-S. Wen R.-F. Huang J.-J. Pi G.-H. Zhang S.-X. Stability of SARS coronavirus in human specimens and environment and its sensitivity to heating and UV irradiation *Biomed Environ Sci* 16 2003 246 255 14631830 17 Spaulding E.H. Role of chemical disinfection in the prevention of nosocomial infections Brachman P.S. Eickhoff T.C. Proceedings of the International Conference on Nosocomial Infections, 1970 1971 American Hospital Association Chicago, IL 247 254 18 Ultrasound system cleaning and disinfection. [Accessed 23 May 2020]. Available from: https://global.medical.canon/products/ultrasound/more_information/ul_cleaning_covid_19 . 19 Ultrasound care and cleaning Philips healthcare. Philips. [Accessed 23 May 2020]. Available from: <https://www.usa.philips.com/healthcare/resources/feature-detail/ultrasound-care-and-cleaning> . 20 Bourouiba L. Turbulent gas clouds and respiratory pathogen emissions: potential implications for reducing transmission of COVID-19 *JAMA* 323 2020 1837 1838 32215590 10.1001/jama.2020.4756 21 Ong S.W.X. Tan Y.K. Chia P.Y. Lee T.H. Ng O.T. Wong M.S.Y. Air, surface environmental, and personal protective equipment contamination by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) from a symptomatic patient *JAMA* 323 2020 1610 1612 32129805 10.1001/jama.2020.3227 PMC7057172 22 Infection prevention and control and preparedness for COVID-19 in healthcare settings — third update. European Centre for Disease Prevention and Control. 2020 [Accessed 25 May 2020]. Available from: <https://www.ecdc.europa.eu/en/publications-data/infection-prevention-and-control-and-preparedness-covid-19-health-care-settings> . 23 WHO Handbook for management of public health events on board ships. WHO. World Health Organization; [Accessed 25 May 2020]. Available from: <http://www.who.int/ihr/publications/9789241549462/en/> . 24 Allam A.E.-S. Ergonenc T. Martos A.G. Perez M.F. Perdisa F. Porta F. Ultrasound-guided interventions during the COVID-19 pandemic — a new challenge *Am J Phys Med Rehabil* 99 2020 580 581 32404639 10.1097/PHM.0000000000001467 PMC7268820 25 Chu D.K. Akl E.A. Duda S. Solo K. Yaacoub S. Schünemann H.J. Physical distancing, face masks, and eye protection to prevent person-to-person transmission of SARS-CoV-2 and COVID-19: a systematic review and meta-analysis *Lancet* 395 10242 2020 1973 1987 32497510 10.1016/S0140-6736(20)31142-9 PMC7263814 Appendix A Supplementary data The following is Supplementary data to this article:

Please cite this article as: Mayordomo L, Collada JM, Hernández FMF, Bueno Á, Insua Vilariño SA, Jiménez-Núñez FG, et al. Seguridad en el uso de la ecografía en reumatología durante la pandemia COVID-19. Documento de posicionamiento de la Sociedad Española de Reumatología. *Reumatol Clin*. 2021;17:284–289.

Supplementary material related to this article can be found, in the online version, at doi: <https://doi.org/10.1016/j.reuma.2020.10.010> .