Revista Médica Electrónica
Rev Méd Electrón
v. 47. 2025
ISSN: 1684-1824
Artículo de revisión

Musculoskeletal diseases: risk in wind instrument musicians

Enfermedades musculoesqueléticas: riesgo en músicos de instrumentos de viento

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ABSTRACT

Musculoskeletal injuries or diseases in musicians reflect the repetitive and specific physical load that the instrument imposes on the body. The present research was carried out with the aim of investigating the occurrence of musculoskeletal disorders in wind instrument musicians. For this purpose, a search for information was carried out in the databases Redalyc, Elsevier Science Direct, PubMed/Medline and SciELO, as well as in ClinicalKey and in the Google Scholar search engine. Advanced search strategies were employed to retrieve information, using structured search formulas. Musicians were identified as being at high risk for developing performance-related musculoskeletal disorders, including overuse injuries, neuropathies, and motor control disorders. Discomfort and dysfunction can severely affect and even end the careers of

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instrumentalist musicians. Recognition of musculoskeletal conditions and early intervention are essential to effectively serve the musician population.

Key words: musculoskeletal diseases; instrumentalists; occupational diseases; wind instruments.

RESUMEN

Las lesiones o enfermedades musculoesqueléticas en los músicos reflejan la carga física repetitiva y específica que el instrumento impone al cuerpo. La presente investigación se realizó con el objetivo de analizar la aparición de trastornos musculoesqueléticos en músicos de instrumentos de viento. Para ello, se realizó una búsqueda en las bases de datos Redalyc, Elsevier Science Direct, PubMed/Medline y SciELO, así como en ClinicalKey y en el buscador Google Scholar. Se emplearon estrategias de búsqueda avanzada para recuperar la información, utilizando fórmulas de búsqueda estructurada. Se identificó que los músicos corren un alto riesgo de desarrollar trastornos musculoesqueléticos relacionados con el rendimiento, incluidas lesiones por uso excesivo, neuropatías y trastornos del control motor. Las molestias y disfunciones pueden afectar gravemente, e incluso acabar con la carrera de los músicos instrumentistas. El reconocimiento de las afecciones musculoesqueléticas y la intervención precoz, son esenciales para atender eficazmente a la población de músicos.

Palabras clave: enfermedades musculoesqueléticas; instrumentistas; enfermedades profesionales; instrumentos de viento.

Recibed: 2024/11/15.

Acepted: 2025/03/01.

INTRODUCTION

Musculoskeletal disorders (MSDs) are defined as any type of discomfort or injury affecting the motor organs, muscles, tendons, bones, cartilage, ligaments, and nerves[1,2]. MSDs also tend to provoke psychological issues, along with pain and mood disturbances, creating a vicious circle[3,4]. Previous evidence shows that individuals with musculoskeletal disorders are twice as likely to have other chronic systemic diseases compared to those who do not suffer from MSDs[5-7]. Therefore, good musculoskeletal health is essential for functional, economic, social and personal independence.

MSDs are the leading contributors to the burden of occupational diseases and are largely associated with workplace ergonomic factors.[8-11] The World Health

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Organization has reported that musculoskeletal disorders are the most common cause of disability and limitations in daily life activities and remunerated employment.[12]

To date, MSDs have received little attention from researchers, given that they are rarely fatal and are often considered irreversible[13,14]. However, the global burden of MSDs has been increasing in recent years, mainly due to population growth and aging.[6] Musculoskeletal injuries or disorders in musicians reflect the repetitive and instrument-specific physical strain placed on the body.[6,15,16]

The lack of resources, deficits in education, and negative connotations are just some of the reasons why musicians do not seek medical attention when suffering from an MSD.[17,18] Unlike the wide variety of medical and physiotherapy professionals who address musculoskeletal disorders, experts specializing in optimizing anatomical function for musicians are limited. If not addressed, the consequences of the injury can lead to temporary, and even permanent, setbacks in their careers.[6]

Musicians perceive health and MSDs as separate entities, or believe that having a MSD is part of the norm. These disorders could be related to the orchestral culture, where injury is seen as a sign of weakness, failure, and lack of musicality, leading musicians to keep the issue to themselves rather than sharing it with colleagues. Musicians also seem to distrust the medical model, as it often overlooks the importance of playing instruments among musicians.[5,19]

MSDs, pain, and fatigue are common medical issues among musicians. These conditions have a significant impact on the physical, psychological, social, and financial well-being of musicians. Due to the high physical and psychological demands of their careers, musicians are especially prone to various musculoskeletal health problems. The interplay of physical and psychological factors can lead to injuries and anxiety related to musical performance. Psychological stress increases muscle tension, which directly contributes to the physical symptoms associated with MSDs. Additionally, the type of musical instruments used may also contribute to musculoskeletal disorders, pain and fatigue.[5,19]

METHODS

A bibliographic search was conducted in the databases Scopus, Redalyc, Science Direct, PubMed/Medline, and SciELO, as well as in ClinicalKey and Google Scholar search engine. Advanced search strategies were employed to retrieve information, using structured search formulas with terms such as "musculoskeletal disease", "musculoskeletal disorder", "musicians", "wind instruments", among others, including their Spanish equivalents. From the resulting documents, those providing theoretical and empirical information about musculoskeletal diseases in wind instrument musicians, in either Spanish or English language, were selected.

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DEVELOPMENT

For a musical instrument to sound correct, its performance must be practiced and refined properly, which requires the body to be positioned adequately and the posture adjusted to the specific instrument. When playing an instrument, every part of the body is held in a forced position. Improving instrument performance requires daily practice, often involving many hours of exercise, making the time spent in a non-physiological body position a significant part of the day. Performing repetitive movements for extended periods and engaging the same muscle groups can lead to pathological changes in the musculoskeletal system. Pain is often the first warning sign, but it is usually overlooked at the beginning.[20]

Musculoskeletal pain caused by playing musical instruments can lead to performance decline, sick leave, and the potential for a musician's career to be interrupted prematurely. This early retirement is often due to overuse, improper technique, poor posture, stress and insufficient rest, all of which contribute to the ailments that lead musicians' careers to be cut short. Despite these consequences, musicians often accept their pain and continue playing, even as it worsens.[5]

Several studies have shown a consistent pattern where the most affected body parts are the upper extremities (shoulder, wrist, hand, fingers and thumb), and the vertebrae (neck, upper back, and lower back).[5,19,21]

Due to the various types of instruments, musculoskeletal ailments can differ among musicians. Each instrument requires a different body position from the musician, presenting different challenges to the musculoskeletal system. Recent studies confirm the incidence of musculoskeletal disorders in 80-90% of musicians.[15,20]

Several studies report that musicians who play string instruments are the most affected by MSDs. Nevertheless, wind instrumentalists experience more intense pain compared to string instrumentalists. The right hand and wrist are the most affected parts of the body for woodwind players.[5,19,22]

Music students are not exempt from experiencing moderate levels of pain. Additionally, the average monthly and yearly prevalence faced by first-year music students was higher than that of non-music students.[5,23]

All musicians, regardless of the instrument they play, are susceptible to developing an MSD. The required body movements share similarities with the musculoskeletal issues found in other occupations[19,23]. On average, 80 % of instrumental musicians experience some form of musculoskeletal injury during their careers.[16,23]

Risk factors for the development of MSDs are related to biomechanical factors, perceived physical environment, duration and intensity of performance, instrument weight, previous musculoskeletal injuries, performance anxiety, high levels of stress, and insufficient recovery. Identifying associations between the type of instrument and the location of injuries has proven to be challenging.[23]

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Woodwind instrumentalists experience more musculoskeletal pain in the neck, wrist, and hand. Brass players report less pain in the elbow, wrist/hand, and lower back compared to other stringed instrument musicians. Despite numerous epidemiological assessments, establishing a reliable association between the type of instrument played and the risk to suffer performance-related musculoskeletal disorders remains challenging.[19,21,23]

It is imperative for healthcare professionals who treat musicians to take a thorough clinical history of the patient to understand the existing or potential physical and psychological factors. Changes in musical workload or performance intensity (practice, instructor, instrument), the instructor, general and specific physical fitness (flexibility, injuries, anatomical deformities), diet, psychological stress, exercise habits, and substance abuse can all affect the risk and recovery of a musician from performance-related musculoskeletal disorders.[23,24]

Sustained high levels of performance or sudden increases in performance load lead to overuse and excessive strain on the musculoskeletal system, placing undue stress on the body. These factors, along with poor injury management, represent a significant risk for developing MSDs.[15,21,23]

After periods of reduced performance, such as during holidays, musicians often do not resume playing in a consistent and gradual manner.[23]

Although some physical risk factors are non-modifiable, their potential impact must be considered. Performance conditions such as temperature[11], required travel, breaks, and the duration of rehearsals and performances may be unavoidable, but indirect efforts can help restrict these inconveniences. While demanding repertoires may sometimes be mandatory, they can be managed more efficiently through mental practice rather than repetition. Individual size and proportions, elements of anthropometry, are generally unchangeable, but adjustments to technique, instrument, and conditioning can help prevent imminent risk. Frequent and structured breaks would allow musicians to recover from the constant strain and burden placed on their muscles, tendons, and joints.[23,25,26]

A general recommendation of taking a 5-minute break for every 25 minutes of performance may help reduce the risk of developing MSDs. It may be necessary to increase the duration and frequency of breaks for musicians performing more complex repertoires. Rest periods of 3 to 7 days can optimize tissue recovery and protect their integrity following an acute musculoskeletal injury.[23]

Gender and age

The relationship between the development of MSDs in musicians and gender or age has been investigated. There are gender differences in overall MSD cases, as the incidence is significantly higher in women than in men across all age groups.[6,23]

A higher prevalence has been found among younger female instrumentalists[21,23,24]. Research suggests that the gender disparity in MSD incidence may be attributed to genetic, hormonal, environmental, and social factors, such as ligament laxity, estrogen, progesterone, exercise, and workplace posture. In particular, pregnancy and

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menopausal events have a significant impact on the development and prognosis of MSDs in women.[6,16,26]

Studies assessing the frequency of musculoskeletal pain in professional orchestra musicians based on their instrument affiliation have found that female gender and performance anxiety are predictors of MSDs.[16,23]

Dystonia, a condition that can end a career, affects men more frequently than women. Female musicians report higher levels of anxiety and depression compared to their male counterparts. Male musicians tend to consume substances more than females. Nodal osteoarthritis (OA) of the interphalangeal joints of the fingers and the base of the thumbs is more common in women, while OA of the second and third metacarpophalangeal joints is more common in older men than in women.[16,23]

The type of instrument chosen by female musicians may be a better predictor of injury risk. String instruments are more frequently selected by women, suggesting, therefore, that instrument choice, rather than gender, may be the most important factor in determining the risk of MSDs.[23]

Overall physical condition

According to contemporary literature, there is a lack of education about health and overall physical condition when musicians begin their practice. The limited structured education on rest after injury, lifestyle modifications, and early identification of injuries place musicians at unnecessary risk of developing MSDs.[16]

Lack of general physical conditioning, joint hypomobility or laxity, and previous injuries are risk factors for musculoskeletal injuries. Each musician has individual limiting variables that make these risk factors either modifiable or non-modifiable.[27]

An example is joint laxity due to a previous injury or an underlying condition such as Ehlers-Danlos syndrome. Individuals affected by this syndrome may not improve, regardless of treatment. Other studies have shown contradictory evidence regarding the insufficient prevention of MSDs in musicians who participate in generic aerobic and strengthening programs.[28]

Unlike competitive athletes, musicians do not have exercise plans specifically designed for the prevention of MSDs. Given the similarities between athletes and musicians, designing and implementing targeted programs could be both cost-effective and beneficial in improving functional outcomes.[23,29]

The American College of Sports Medicine recommends that, to improve cardiovascular fitness, a healthy adult should engage in five sessions of moderate-intensity exercise per week for at least 30 minutes or three sessions of high-intensity exercise per week for 20 minutes. Examples of moderate-intensity exercise include brisk walking, low-resistance cycling, swimming, and jogging. According to the same guidelines, muscle conditioning can be improved with two weekly resistance training sessions. Ideally, 2-3 sets of 10-20 repetitions should be performed with 90 seconds of rest between each set, with the goal of working 8-10 muscle groups per week.[30]

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There are exercise regimens aimed at targeting specific body regions and increasing the endurance of the distinctive musculature, and they should be employed to enhance motor function and movement patterns.[29]

It is feasible to think that reducing the frequency and severity of MSDs among musicians can be achieved through the implementation of specific exercise regimens over several weeks to strengthen and support commonly injured muscles. Perseverance and adherence are limiting factors in realizing the health benefits of an exercise program. Musical performance requires a significant amount of time, and many existing variables can pose significant challenges to the successful implementation of regular exercise programs. The possibility of doing group exercise sessions before or after rehearsals could be considered.[23,26,29]

Nutrition

Proper hydration and nutrition, beyond what is required by the general population, are essential for preventing musculoskeletal disorders and achieving satisfactory recovery. Nevertheless, there are no formal guidelines on nutrition and hydration specifically for musicians.[23]

Playing an instrument is an intense endurance activity that requires a strategic distribution of daily meals and snacks composed of the appropriate amounts of carbohydrates, fats, proteins, vitamins, and minerals to sustain optimal performance. Proper hydration before, during, and after rehearsals and performances is essential.[23]

Recommendations should be individualized based on body type, co-morbid conditions (e.g. diabetes), medication use (e.g. diuretics) and environmental factors (e.g. temperature).[23]

Severe nutritional depletion poses a significant risk to musculoskeletal health. Similar to athletes, who face high levels of personal and external stressors along with perfectionism, eating disorders are common among musicians and must be addressed adequately.[23,26]

Psychological and psychosocial risk factors

Psychological risk factors that may predispose musicians to injury encompass a wide range of psychiatric symptoms and conditions, including performance anxiety, depression, mood disorders, social phobias, and extreme personality traits or personality disorders such as somatization and hypochondria. The psychosocial factors to be considered include financial circumstances and potential burdens, external perfectionism, and other sources of external pressure, including institutional, work-related, educational, and peer pressures[23,26]. Extreme perfectionist traits can also contribute to poor injury reporting and management.[23]

Hearing deficits reported by musicians have been associated with psychological symptoms, a deteriorated psychosocial environment, and perceived stress. Given the high risk of noise-induced hearing loss among orchestra musician, both physical and

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psychological evaluations should be considered, as disabilities can impact the development of MSDs.[23]

Performance anxiety and work-related stress appear to be positively associated with musculoskeletal disorders in musicians, although current evidence is limited, and sometimes inconsistent. The relationship between psychological and physical well-being is complex, warranting further research and recommendations for the detection, prevention, and treatment of these conditions in the musician population.[23,29]

CONCLUSIONS

Musicians are at high risk of developing performance-related musculoskeletal disorders, including overuse injuries, neuropathies, and motor control disorders. Pain and dysfunction can severely affect, and even end, an instrumental musician's career.

The recognition of musculoskeletal conditions and early intervention are essential for effectively addressing the needs of the musician population. Instrumental musicians deserve tailored research studies aimed at determining how they are impacted by music-related musculoskeletal disorders, in addition to educational programs, therapeutic regimens, and personalized treatment approaches.

It is necessary to implement well-designed prospective studies to identify more accurately the causal relationships between etiology and the risk of developing performance-related musculoskeletal disorders in instrumental musicians.

REFERENCES

1. Castillo-González W. Kinesthetic treatment on stiffness, quality of life and functional independence in patients with rheumatoid arthritis. AG Salud. 2023;1:20. DOI: 10.62486/agsalud202320.

2. Ron M, Pérez A, Hernández-Runque E. Health risk level and prediction of musculoskeletal pain in workers under telework conditions: A matrix approach. Rehabil Interdiscipl. 2023;3:40. DOI: 10.56294/RI202340.

3. Burgos Navarrete F, Labrador Parra A, Escalona E. Protocol for assessing physical fitness at work: methodological proposal. AG Salud. 2024;2:69. DOI: 10.62486/AGSALUD202469.

4. Ron M, Pérez A, Hernández-Runque E. Prevalence of self-perceived musculoskeletal pain and its association with gender in teleworkers of the management team of a Venezuelan food manufacturing company. Rehabil Interdiscipl. 2023;3:51. DOI: 10.56294/RI202351.

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5. Che Daud AZCCD, Fauzi N, Mohamad Sabri MQ, et al. Musculoskeletal Disorders, Pain and Fatigue among String and Wind Music Students. E-BPJ [Internet]. 2022 [accessed 2024/09/03];7(20):261-7. Available from: https://ebpj.e-iph.co.uk/index.php/EBProceedings/article/view/3457

6. Liu S, Wang B, Fan S, et al. Global burden of musculoskeletal disorders and attributable factors in 204 countries and territories: a secondary analysis of the Global Burden of Disease 2019 study. BMJ Open [Internet]. 2022 [accessed 2024/09/03];12(6):e062183. Available from: https://bmjopen.bmj.com/lookup/doi/10.1136/bmjopen-2022-062183

7. Markova V, Ganchev T, Filkova S, et al. MMD-MSD: A Multimodal Multisensory Dataset in Support of Research and Technology Development for Musculoskeletal Disorders. Algorithms [Internet]. 2024 [accessed 2024/09/03];17(5). Available from: https://www.mdpi.com/1999-4893/17/5/187

8. Acosta RH. Working conditions, ergonomic risks and their effects on the health of nursing personnel. Salud Cienc Tecnol. 2022;2:61. DOI: 10.56294/SALUDCYT202261.

9. Fernández Queija Y, Campello Trujillo LE, Capote Fernández MM, et al. Musculoskeletal disorders and ergonomics in stomatologists in the municipality of Cotorro. Salud Cienc Tecnol. 2024;3:735. DOI: 10.56294/sctconf2024735.

10. Fernández Queija Y, Campello Trujillo LE, Rodríguez Yane A, et al. Trends and risk factors in musculoskeletal disorders among stomatologists. Salud Cienc Tecnol. 2024;3:734. DOI: 10.56294/sctconf2024734.

11. Medina Reverón M, Pérez Galavís A, Ron M, et al. Thermal Stress and Impact on Health in Workers of Refrigeration. Health Leadership Quality Life. 2023;2:31. DOI: 10.56294/hl202331.

12. Krishnan KS, Raju G, Shawkataly O. Prevalence of Work-Related Musculoskeletal Disorders: Psychological and Physical Risk Factors. Int J Environ Res Public Health [Internet]. 2021 [accessed 2024/09/03];18(17):9361. Available from: https://www.mdpi.com/1660-4601/18/17/9361

13. Pérez Cortés A. Enhancing Customer Experience: Trends, Strategies, and Technologies in Contemporary Business Contexts. SCT Proc Interdiscip Insights Innov. 2024;2:235. DOI: 10.56294/piii2024235.

14. Suarez N, Páramo M, Rodríguez C, et al. Working conditions and health effects of workers in a microware manufacturer of medical furniture, Maracay 2019. Management (Montevideo). 2024;2:27. DOI: 10.62486/agma20245.

15. Adesegun O, Ojuola O, Osonuga A, et al. Effects of Music on Health: The Plight of the Piper. Online J Health Allied Scs [Internet]. 2019 [accessed 2024/09/03];18(3). Available from: https://www.ojhas.org/issue71/2019-3-9.html

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16. Kok LM, Huisstede BMA, Voorn VMA, et al. The occurrence of musculoskeletal complaints among professional musicians: a systematic review. Int Arch Occup Environ Health [Internet]. 2016 [accessed 2024/09/09];89:373-96. Available from: http://link.springer.com/10.1007/s00420-015-1090-6

17. Quispe L, Arauco E, Mauricio Esteban CA. Assessment of quality of work life and healthy lifestyles in nursing professionals: review of the conceptual framework and background. Multidiscip (Montev). 2024;2:92. DOI: 10.62486/agmu202492.

18. Trujillo Piedrahita F. Business challenges that employees face today. SCT Proc Interdiscip Insights Innov. 2024;2:244. DOI: 10.56294/piii2024244.

19. Okoshi K, Minami T, Kikuchi M, et al. Musical Instrument-Associated Health Issues and Their Management. Tohoku J Exp Med [Internet]. 2017 [accessed 2024/09/09];243(1):49-56. Available from: https://www.jstage.jst.go.jp/article/tjem/243/1/243_49/_article

20. Kornek M, Kaczorowska A, Mroczek A, et al. Musculoskeletal pain in professional orchestra instrumentalists and its determinants: a Polish pilot study. J Life Sci [Internet]. 2022 [accessed 2024/09/03];68(4):39-46. Available from: https://ojs.pum.edu.pl/pomjlifesci/article/view/828

21. Edling CW, Fjellman-Wiklund A. Musculoskeletal Disorders and Asymmetric Playing Postures of the Upper Extremity and Back in Music Teachers: A Pilot Study. Med Probl Perform Artists. 2009;24(3):113-8. DOI: 10.21091/mppa.2009.3025.

22. Shanoff C, Kang K, Guptill C, et al. Playing-related injuries and posture among saxophonists. Med Probl Perform Artists [Internet]. 2019 [accessed 2024/09/03];34(4):215-21. Available from: https://pubmed.ncbi.nlm.nih.gov/31800673/

23. Lee SH, Morris ML, Nicosia SV. Perspectives in Performing Arts Medicine Practice: A Multidisciplinary Approach [Internet]. Cham: Springer International Publishing; 2020 [accessed 2024/09/09]. Available from: http://link.springer.com/10.1007/978-3-030-37480-8

24. Ackermann BJ, Kenny DT, Fortune J. Incidence of injury and attitudes to injury management in skilled flute players. Work (Reading, Mass) [Internet]. 2011 [accessed 2024/09/09];40(3):255-9. Available from: https://pubmed.ncbi.nlm.nih.gov/22045531/

25. Bruyneel AV, Stern F, Schmid A, et al. Network analyses of physical and psychological factors of playing-related musculoskeletal disorders in student musicians: a cross-sectional study. BMC Musculoskelet Disord. 2024;25:979. DOI: 10.1186/s12891-024-08103-8.

26. Brandfonbrener AG. Musculoskeletal problems of instrumental musicians. Hand Clin. 2003;19(2):231-9. DOI: 10.1016/s0749-0712(02)00100-2.

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27. Cruder C, Barbero M, Koufaki P, et al. Prevalence and associated factors of playing-related musculoskeletal disorders among music students in Europe. Baseline findings from the Risk of Music Students (RISMUS) longitudinal multicentre study. PLoS One. 2020;15(12):e0242660. DOI: 10.1371/journal.pone.0242660.

28. Noori Z, Daneshmandi H, Hosseini SH. A comparative study of musculoskeletal imbalances in professional musicians. Sport Sci Health. 2020;12(2):135-44. DOI: 10.32598/JESM.12.2.2.

29. Chong J, Lynden FM, Harvey D, et al. Occupational Health Problems of Musicians. Can Fam Physician [Internet]. 1989 [accessed 2024/09/09];35:2341-8. Available from: https://pubmed.ncbi.nlm.nih.gov/21248930/

30. Franklin BA, Eijsvogels TMH, Pandey A, et al. Physical activity, cardiorespiratory fitness, and cardiovascular health: A clinical practice statement of the American Society for Preventive Cardiology Part II: Physical activity, cardiorespiratory fitness, minimum and goal intensities for exercise training, prescriptive methods, and special patient populations. Am J Prevent Cardiol [Internet]. 2022 [accessed 2024/09/09];12:100425. Available from: https://pubmed.ncbi.nlm.nih.gov/36281325/

Conflicts of interest

The authors declare no conflict of interest.

Responsible editor: Silvio Soler-Cárdenas.

HOW TO CITED THIS ARTICLE

Maldonado E, González-Argote J, Vitón-Castillo AA. Musculoskeletal diseases: risk in wind instrument musicians. Rev Méd Electrón [Internet]. 2025 [citado: fecha de acceso];47:e6198. Disponible en: http://www.revmedicaelectronica.sld.cu/index.php/rme/article/view/6198/6134

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