

Original article

Swimming sport in during the COVID-19 pandemic

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ABSTRACT

Swimming as a discipline that requires specific conditions for both training and recreation suffered greatly during the pandemic period. Due to the closure of swimming pools, school swimming pools, and aquaparks, it was impossible to practice this sport. Safety considerations, as an overriding social responsibility objective, and thus reducing disease incidence have been at the forefront of the fight against coronavirus.

The paper attempts to explore the safety measures used to curb the spread of COVID-19 and the restrictions on swimming pools that have been put in place after their opening.

KEYWORDS

swimming, safety, pandemic, COVID-19

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Introduction

The paper aims to learn and explain the meaning of the restrictions that have been put in place. The COVID-19 pandemic caused a worldwide lockdown, slowing down the economy and paralyzing the lives of the global population [1]. In addition to teaching, social life, sports, mass events, and entertainment changed due to the epidemic [2, p. 12-15]. There were introduced restrictions to increase social distance, the order to wear masks, and a general order not to leave home without urgent need. The world of sport was no less affected by the imposition of new restrictions than other spheres of life. All the above eventually contributed to the closure of sports-related areas, including swimming pools. While one can talk about the implementation of training at home in other disciplines, the specificity of swimming, which is the most peculiar in terms of the conditions that must be met to practice it, seems to be impossible to achieve. It is impossible to carry out swimming workouts in an aquatic environment without specific infrastructure in swimming pools or open waters. The study attempts to explain the introduced restrictions and their consequences.

The SARS-CoV-2 virus belongs to a group of a large proportion of coronaviruses [3]. Many of them cause the common seasonal cold. The history of coronaviruses is known in the world. One example involves southern China when an outbreak of SARS-CoV occurred in 2003 and caused more than 8,000 illnesses. It did not spread beyond China and Hong Kong thanks to, among others, the World Health Organization's intensive efforts. Another virus became notorious in 2012 when there was a sharp increase in the number of cases of a previously unknown viral disease called – MERS-CoV on the Arabian Peninsula. It ended up with over a thousand cases in various countries in the Middle East and the second center of the epidemic in South Korea. However, even that virus did not cause a global pandemic.

From an evolutionary standpoint, viruses, like all organisms, want to produce as many proteins and nucleic acids as possible in future generations. A virus must adhere to at least two evolutionary principles to maintain that [4]. The first one is related to its rapid multiplication in the body, bypassing the sophisticated defenses of our immune systems. By multiplying, the virus can more easily pass from person to person to continue to reproduce. If it multiplies too much, it can have a fatal effect on the infected person by limiting the possibility of transmission. The other principle states that “a virus cannot be too lethal because it kills itself”. According to Rafał Mostowy, “at present, SARS-CoV-2 can both transmit efficiently from person to person (one infected person passes it onto 2-4 other people an average), it also has a much lower mortality rate than its predecessors (currently estimated at between 0.7-2.0 percent). That makes it much harder to stop it” [5; 6].

Considering the type and place of infection, the Director of the National Institute of Public Health – National Institute of Hygiene, while discussing the possibility of using swimming and bathing pools, spas, jacuzzi, water playgrounds during the current COVID-19 pandemic, emphasized that there were no cases of SARS-CoV-2 infection. The information concerned both drinking and recreational water of controlled quality, including water in swimming pools, subjected to treatment and disinfection. Numerous public health institutions around the world and those of the WHO and CDC reported similar information [7].

The Director emphasized that “COVID-19 is not a water-dependent disease. Attention was drawn in this context to the susceptibility of SARS-CoV-2 as an enveloped virus to numerous disinfectants. Chlorine (sodium hypochlorite), whose standard doses and concentrations commonly used in water treatment and disinfection in public swimming pools also effectively eliminates particles of this microorganism” [7].

Vardoulakis and co-authors write that “Conventional water treatment methods based on filtration and disinfection, including chlorination and UV light, can effectively inactivate SARS-CoV-2 and other human coronaviruses” [8].

The above evidence indicates that the water environment is safe as a source site for COVID-19 infection.

1. Development of restrictions during the spring phase of the pandemic in Poland

Poland and many other countries around the world implemented restrictions aimed at reducing the spread of COVID-19. Many institutions, businesses, and companies had to change many of their procedures and make changes to their existing operations to ensure their citizens' safety and health. On January 25, 2020, special procedures for passengers arriving from the People's Republic of China, such as specific location forms (allowing contact with people

arriving from the country as mentioned earlier) and examining people with symptoms, were introduced at Chopin Airport in Warsaw.

Given the increased risk due to SARS-CoV-2 infection, from 31 January 2020, the Polish sanitary authorities, connected with the spread of the disease in the country, have started to conduct laboratory tests among patients who were suspected of being infected with the SARS-CoV-2 virus. In regularly published notices for travelers, the Chief Sanitary Inspectorate warned against traveling to countries with numerous disease centers. It advised taking precautions by using PPE and avoiding large concentrations of people in areas with significant outbreaks.

At the end of February 2020, a visitation ban was imposed in hospitals. On March 2, LOT Polish Airlines reduced the number of flights to Italy and South Korea and Ryanair and canceled some flights to Italy.

On March 6, the current Speaker of the Sejm, Elżbieta Witek, canceled foreign delegations' visits to the Sejm for 21 days, and Polish authorities banned the export from the country of medicines and medical supplies that could be useful in the fight against coronavirus.

At the same time, the Head of the Chancellery of the Prime Minister, Michał Dworczyk, announced support for the companies, the launch of a helpline for doctors, and the exemption of spirit (used in the production of biocides) from excise duty.

In mid-March this year, Poland got involved in the mechanism of joint crisis tenders existing in the European Union, concerning, among others, purchases of protective measures, vaccines, and medicines.

The testing of samples for SARS-CoV-2 coronavirus was also launched. The National Institute of Public Health – National Institute of Hygiene (NIZP-PZH) handled that. As of February 29, 2020, there were 307 tests (28 pending). Some of those samples were tested by the Berlin Charité Hospital. The present study was also conducted in two laboratories in Warsaw: NIZP-PZH and the Provincial Infectious Diseases Hospital in Warsaw [9]. Two centers (in Olsztyn and Wrocław) were also prepared for operation. Laboratories in the remaining Polish cities were undergoing necessary preparations to perform their own testing activity [9].

For comparison of testing conducted in other countries, the number of tested samples (as of February 29, 2020) was as follows: about 450 in the USA, 800 in France, and 350 in Austria (it should be noted that not all countries provide such data).

As of March 4, 2020, 9 laboratories started functioning in Poland, where samples were tested for COVID-19 virus. These were the National Institute of Public Health – National Institute of Hygiene in Warsaw, the Provincial Infectious Diseases Hospital in Warsaw, and the laboratories in Olsztyn, Wrocław, Poznań, Katowice, Rzeszów, Gdańsk, and Kielce. As of March 6, 2020, the number of laboratories increased to thirteen, and the number of tests performed went up to 900.

Unfortunately, due to the growing incidence of the disease, on March 8, 2020, the Chief Sanitary Inspector recommended canceling all mass events organized indoors with more than 1000 people [9]. Two days later, the Rector of the University of Warsaw, Marcin Pałys, Ph.D., canceled all lectures and classes for students, Ph.D. students, and listeners between March 11 and April 14, 2020, except for those held remotely. At the Jagiellonian University, lectures for students and doctoral students and physical education classes were canceled by the Rector Prof. Wojciech Nowak's order. The Rector of the Wrocław University of Technology and the President of the Rectors College of Wrocław and Opole University, Prof. Cezary

Madryas, informed that as of March 11, “all forms of teaching” will be suspended at 14 public universities in Lower Silesia and Opole provinces. The Rector Professor Andrzej Lesicki’s order suspended classes at the Adam Mickiewicz University in Poznan from March 11, 2020, until further notice. Classes were also suspended at the University of Silesia in Katowice and the University of Gdańsk. On the same day, there was a meeting of the National Security Council concerning actions in the face of COVID-19.

Prime Minister Mateusz Morawiecki canceled all mass events. At the same time, a decision was made in Poznań that all schools, kindergartens, nurseries, and other city institutions will be closed for two weeks (i.e., from March 11 to 24) [10]. Protective masks became an article on sale to the general public.

On March 11, 2020, by the decision of the Prime Minister and the Ministers (of Health, National Education, Higher Education: Łukasz Szumowski, Dariusz Piontkowski, and Jarosław Gowin, respectively) closed educational institutions for two weeks (i.e., March 12-25) as a preventive measure. According to the decisions both on Thursday and Friday (March 12, 2020), students could come to school for care (when parents could not take care of their child), and the complete closure of facilities took place from Monday, March 16, 2020. The above Regulation applied to all schools (public and non-public), kindergartens, nurseries, and high schools and colleges, except for special schools, educational or socio-therapy centers, psychological-pedagogical clinics, and schools at correctional institutions and prisons.

Two days later (Friday, March 14, 2020), the closure of Polish borders to air and rail traffic was announced (from March 15). Passport controls were introduced at all land borders. Only employees and Polish citizens were allowed to enter the country. After crossing the border by land, people were to be under a 14-day quarantine. Violation of the quarantine was punishable by a fine of 5000 PLN.

At the same time, public gatherings of over 50 people were banned, including state and religious gatherings.

On March 20, 2020, a state of the epidemic was introduced, and the fine for breaking the quarantine was announced to grow from 5 thousand to 30 thousand zlotys [11]. New security rules were imposed, among others, the prohibition of movement in addition to:

- carrying out professional activities or tasks, or non-agricultural economic activity, or conducting agricultural activity, or work on a farm, and purchase of goods and services related thereto [12],
- satisfying necessary needs connected with everyday matters, including obtaining health care or psychological care (also of a person closest to the displaced person, and if the displaced person is in cohabitation with another person – also of a person closest to the person in cohabitation, and purchasing goods and services connected therewith),
- performing voluntary and unpaid services to counter the effects of COVID-19, including as a volunteer,
- performing or participating in religious worship, including religious acts or rituals [13].

According to the WHO, the fundamental element of protection against infection is wearing a protective mask. From Thursday, April 16, 2020, it is mandatory to cover the mouth and nose. Every person in a public place had to wear a mask, scarf, or bandana to cover both the mouth and nose. That applied to everyone on the streets and in offices, stores, places of

service, and workplaces [1]. Figure 1 shows how to put on and take off the mask correctly. There is a ban on assembly of more than two people and limitations on public transport and walking, and participation in religious ceremonies (up to 5 people). Those rules came into force on March 25, 2020 [9]. On March 25, 2020, at a press conference, the Minister of Internal Affairs and Administration, Mariusz Kaminski, announced the decision based on international law, in connection with the development of the epidemic in Europe and the world, to extend the closure of borders by 20 days to April 13, 2020 (the previous period lasted ten days – March 15-25). The Minister noted that the restrictions did not apply to the movement of goods, which continued to occur freely [10]. From April 1, 2020, further restrictions were introduced to combat the virus. Those applied to people under the age of 18, who could only be in public spaces with an adult guardian [15]. What is more, parks, boulevards, and beaches were ruthlessly closed, and hair salons, beauty salons, and tattoo studios were suspended. In stores and service outlets, the number of customers could not exceed three times the number of cash registers (twice the number of counters in the case of post offices) [16]. Only people over 65 years of age were served between 10 am and 12 pm in stores and service

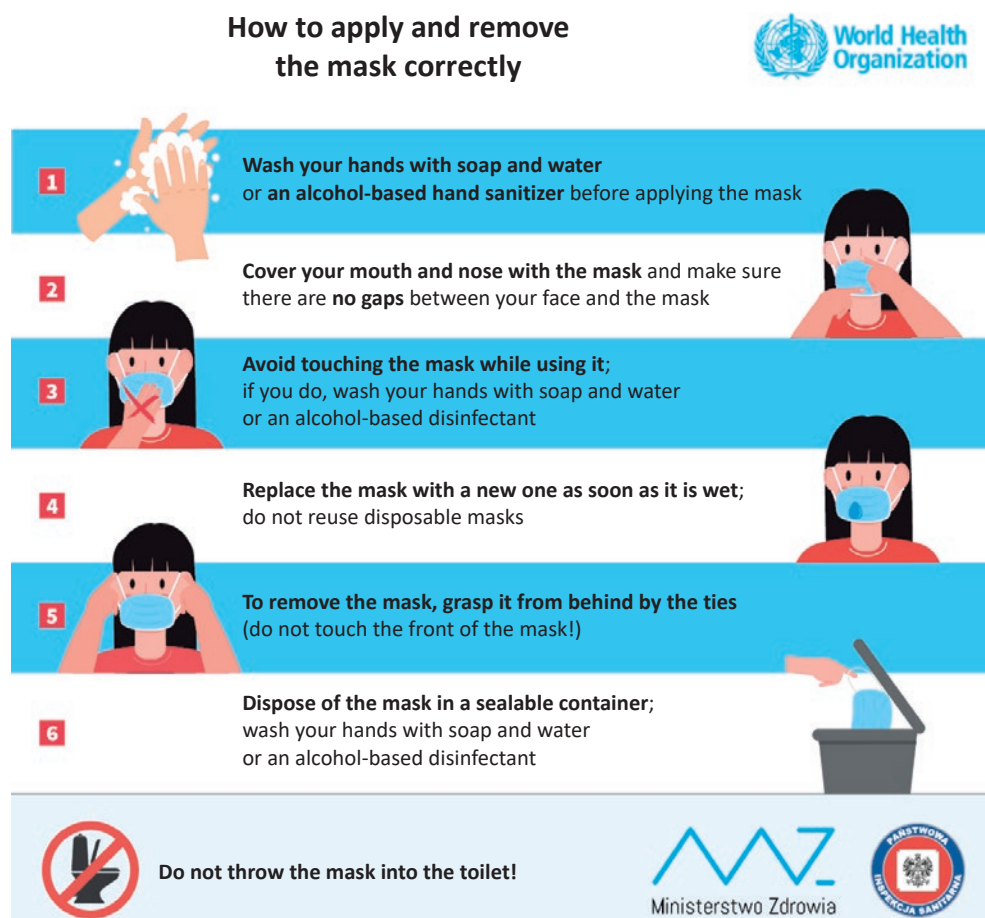


Fig. 1. Proper application and removal of the mask
Source: [14].

outlets. It was the duty of each store to equip the staff with personal protective equipment, and the customers in the stores should wear only protective gloves.

Key elements of safety principles to minimize the risk of infection include:

- keeping your distance,
- keeping your mouth and nose covered,
- quarantine,
- avoiding gatherings.

The principles are also shown in Figure 2.



Fig. 2. Safety rules
Source: [17].

2. Swimming sport during the pandemic

The Regulation of the Council of Ministers of March 31, 2020, on the establishment of certain restrictions, orders, and prohibitions in connection with the occurrence of an epidemic state (Journal of Laws, item 566) banned conducting activities related to sports, entertainment, and recreation (included in the Polish Classification of Activities in section 93.0 and in subclass 96.04.Z) by the entrepreneurs within the meaning of the provisions of the Act of March 6, 2018 – Entrepreneurs’ Law and by other entities. It consisted, inter alia, in the prohibition of:

- 1) the operation of open-air or indoor sports facilities (including stadiums, race tracks, swimming pools, golf courses, bowling alleys, gyms, and other sports and recreational facilities),
- 2) activities of sports teams and clubs,
- 3) organization, promotion, sponsorship, and management of sports events,

- 4) operation of fitness centers and clubs and other facilities for physical fitness and bodybuilding,
- 5) activities related to the organization of sports leagues,
- 6) activities of individual athletes and referees,
- 7) recreational activities at facilities or provision of services to satisfy recreational needs (including the organization of various entertainment and recreational attractions such as water slides, games, shows, themed exhibitions and outdoor events, including festivals, amusement parks and amusement parks, ski slope operation, recreational equipment rental, discos, dance halls, and other recreational events),
- 8) prohibiting service activities related to physical fitness (e.g., saunas, beauty salons, massage parlors, others [10]).

As of June 6, 2020, the opening of gym pools, fitness clubs and other sports facilities. Table 1 shows the stages of restoring sports activities.

Table 1. Stages of restoring sports activities

	Stage II	Stage III	Stage IV
Sports activity	<ul style="list-style-type: none"> – sports infrastructure of an open character – up to 6 users (stadiums, pitches, Orlik pitches, tennis courts) – launching activity in first Olympic Preparation Centers – launch of individual training in professional sports 	<ul style="list-style-type: none"> – sports classes in halls and arenas (max. 6 people) – group trainings in professional sports – opening of further sports centers for Olympians and athletes 	<ul style="list-style-type: none"> – the operation of fitness clubs, gyms, dance clubs, etc. – sports events for up to 50 people in open space

Source: [18].

Research methodology

In accordance with the methodology of scientific research, the study used the method of examining document. The document examination method is based on the analysis of existing materials and usually takes place within formalized groups. Such research is often conducted in institutions or companies, where legal acts, official documents, and regulations that determine the profile and method of activity constitute the foundation of operation. Due to legal provisions, formalized organizations perform most of their tasks based on existing documents or create new ones in such circumstances. In practice, they bear the stamp of the institution and the signature of a competent person, which determines their validity and correctness. In this way, entire databases of essential data are frequently created, accurately describing the organizational structure, internal or external environment, where the examined structure functions. As the research material in this case, documents may contain a lot of important information about the organization, people working in it, contractors, and even controlling bodies. As a rule, most of them are archived; it facilitates access to them and their thorough analysis depending on the needs.

The document examination method can be divided into the following steps:

- collection,
- selection,

- determining the degree of authenticity of documents,
- description,
- scientific interpretation.

Guidelines were put in place at swimming pools in their respective areas in an effort to prevent COVID -19 infections. Their contents are outlined below.

- I. In the entrance/checkout area, it is recommended that:
 - 1) in the case of non-automatic entrance doors, they are always left open when the facility is in operation, as a contribution to avoiding touching them,
 - 2) a 1.5 m distance on the floor in front of the checkout/cloakroom or the waiting area are marked clearly,
 - 3) there can be one person directly in front of the cashier/cloakroom. Information should be posted outside in front of the entrance door and/or next to the checkout/cloakroom window,
 - 4) bracelets and/or keys (to lockers) are disinfected after each user,
 - 5) posting clear information at the entrance to the facility about the prohibition of using clear information is posted at the entrance to the facility that persons with symptoms of any acute infections, primarily respiratory tract infections, are not allowed to use the swimming pool,
 - 6) chairs and benches in waiting rooms are removed not to allow or encourage resting and waiting or prolonging the stay in the premises of the facility.
- II. In cloakrooms, shower areas, and where possible:
 - 1) only a limited number of lockers, with the possibility of keeping a distance between people using cloakrooms is provided in the case of collective cloakrooms,
 - 2) the number of people using the showers at the same time is determined depending on the size and equipment of the area,
 - 3) lockers are disinfected after each user.
- III. In the swimming pool and sauna area:
 - 1) disinfection of common surfaces such as handles, doors, locker handles, shelves, benches, light switches, faucet taps, handrails, stairs, sanitary surfaces and around swimming pools is carried out regularly.

Furthermore, recommendations were made to facility managers to take every precaution so that the safety of customers using the swimming pool the safety of customers using the swimming pool was ensured. These included:

1. Paying particular attention to:
 - establishing and controlling the maximum number of users taking account of the variation in the size of the facilities; the number of people staying at one time in their premises should be determined individually. The number of people using the facility at one time may not exceed 75% of the maximum load,
 - placing information on the maximum number of users at the entrance to the facility.
2. Maintaining the necessary distance of 1.5 meters between persons queuing and in the swimming pool surroundings, namely, cloakrooms, toilets, showers, paddling pool, by using visible indications (e.g., stickers on the floor or standing signs).

3. Providing hand sanitizer dispensers at entrances, in cloakrooms, at sinks, in toilets and shower rooms.
4. Implementing mandatory hand disinfection by users at the entrance to the facility.
5. Observing the principles of user hygiene at swimming pools – mandatory and thorough bathing and washing of the entire body under the shower before entering the pool hall. Observing strict separation of the shoe and barefoot zone; providing the passage to the pool hall through the foot-washing wading pool.
6. Even distribution of bathers or swimmers in the pool basin, possible consideration of dividing the pool area with ropes/floats into smaller fragments in large facilities.
7. If it is not possible to maintain social distance in small swimming pools and jacuzzi, using them individually or by several people sharing them.
8. Introducing disinfection with chlorine compounds in small swimming pools and jacuzzi, in case it is not carried out.
9. Introducing obligatory wearing of mouth and nose covers by users except for bathing and swimming in the pool; mouth and nose covers should be removed and left with clothing in the cloakroom, from where one should go directly to the shower and through the wading pool to the pool. When dressing after swimming, mouth and nose protection should be put back on in the cloakroom.
10. Restricting one's stay in the facility to the time of swimming in the pool and changing.
11. Disinfecting shared areas in the entrance area, cloakrooms, and dressing rooms that users come into contact with (excluding the floor) on a regular basis (several times a day).
12. Avoiding spraying disinfect larger areas with alcohol-based disinfectants due to the risk of raising the concentration of vapors in the air and exceeding the explosive limit.
13. Displaying instructions in the restroom regarding:
 - hand washing,
 - hand disinfection,
 - taking off and putting on gloves,
 - removing and putting on face masks.
14. Supervising organized group activities such as aerobics or swimming lessons. Limiting the number of people in the group so that the required distances between exercisers can be maintained is indispensable. If these conditions cannot be met, organizing such activities should be ceased until the conditions can be met.
15. Restricting sauna activities:
 - limiting the number of people using saunas at one time to 50% of maximum occupancy,
 - closing saunas that do not provide a temperature greater than 60°C,
 - mandatory use of saunas barefoot, with no outer covering except a towel (sauna doors must remain closed to maintain the desired temperature),
 - no need to wear a mask in the sauna [19; 20].

Conclusion

The swimming sport, like many others, has suffered from the strictures that have brought it to a halt. Despite the proven health effects of physical activity, including occupational, on the body and the critical aspect of hardening the body due to different water temperatures, other factors pose a risk to the body.

The main problem associated with protection against SARS-CoV-2 transmission in swimming pools is not related to water quality. It primarily concerns staying in these facilities, where, as in other public spaces, there is a risk of spreading droplet infection. The virus is transmitted by inhalation by a sick person when talking, laughing, coughing, or sneezing and is dispersed over the distance of approx. 1.5 m. That means that nearby healthy persons can inhale it. At the same time, surfaces on which relatively heavy micro-droplets of respiratory secretions containing virus particles fast settle can also become sources of infection. If not disinfected promptly, these droplets can be spread by hand contact to the mouth and inhaled.

The risk of SARS-CoV-2 infection in those facilities is, therefore, primarily associated with the simultaneous visitation of considerable amounts of users, among whom there may be infected persons, also those who do not show clinical symptoms of the disease. Thus, it is of fundamental importance to limit the number of people staying in the facility at the same time, respect the principle of social distance, and strict application of hygiene rules, including washing hands with soap and water and disinfecting them, in order to prevent the spread of infections. The social consequence of applied restrictions is the reduction of attention to physical fitness and physical rehabilitation affecting the return to normal functioning. In terms of professional sport, the effects will be noticeable over time, primarily preparing for the Olympic Games and international competitions. Swimming sport as a multifaceted one enforces the need to be in the aquatic environment during training, which is the main stimulus, and there is no other way to replace it.

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Conflict of interests

All authors declared no conflict of interests.

Author contributions

All authors contributed to the interpretation of results and writing of the paper. All authors read and approved the final manuscript.

Ethical statement

The research complies with all national and international ethical requirements.

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Sport pływacki w czasach epidemii COVID-19

STRESZCZENIE

Pływanie jako dyscyplina, w której potrzebne są specyficzne warunki zarówno do treningu oraz rekreacji bardzo ucierpiało w czasie okresu pandemii. Przez zamknięcie pływalni, basenów szkolnych czy Aquaparków nie było możliwe uprawianie sportu pływackiego. Względy bezpieczeństwa, jako nadrzędny cel związany z odpowiedzialnością społeczną, a tym samym zmniejszenie ilości zachorowań były i są na pierwszym miejscu w walce z koronawirusem.

W niniejszym opracowaniu podjęto próbę eksplanacji środków bezpieczeństwa użytych w celu ograniczenia rozprzestrzeniania się COVID-19 oraz jakie obostrzenia na pływalniach zostały po ich otwarciu wprowadzone.

SŁOWA KLUCZOWE pływanie, bezpieczeństwo, pandemia, COVID-19

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