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**摘要:** 对水的治疗性能的了解和利用贯穿了整个世界历史。水疗被开发用于协助医疗保健和特定疾病康复的进程。从1950年到1980年水疗的应用曾大幅下降, 20世纪80年代开始, 水中运动的应用出现了一次复兴。本文简要介绍了水疗在骨科、心血管系统、呼吸系统、神经治疗、运动员训练和康复及儿科领域中的实践现状。基于科学研究证实的水中浸入的深远效应, 以及水疗的广泛适用性, 作者预期水疗会有一个更好的未来。

**关键词:** 水疗 历史展望 现状

### Aquatic Therapy: Current Status in the USA and Europe

**ABSTRACT:** The healing properties of water have been known and utilized throughout global history. Aquatic therapies were developed to aid in the processes of health care and healing of specific diseases. They had greatly declined during the years from 1950 through 1980, and there was a resurgence of the use of aquatic exercise from the 1980' s. This essay briefly introduces the current aquatic therapy practices in the field of orthopedics, cardiovascular system, respiratory system, neurologic therapies, athletic training and rehabilitation and pediatrics. Based on the profound effects of immersion proved by science researches and the broad applicability of aquatic therapy, the author expects a better future of aquatic therapy.

**KEYWORDS:** Aquatic Therapy, Historical Perspective, Current Status

# 水疗：欧美发展现状

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## 背景历史

对水的治疗性能的了解和利用贯穿了整个世界历史。许多文化把对这些性能的利用作为其文明的核心特征。罗马浴场起着保健和疗养恢复中心的作用。在欧洲和美国, 水疗中心的建立旨在协助医疗保健和康复的进程。通常这些水疗中心会成为一大社会焦点, 市民们为了健康的益处每年光顾它们。在欧洲, 许多国家都将它们纳入其卫生保健系统, 允许个人接受其服务, 服务费用由政府补贴。但是在美国情况并非如此。

水疗在欧洲和美国都被发展应用于治疗特定疾病, 尤其是关节炎和风湿性疾病、脊髓灰质炎、呼吸系统疾病、肌肉骨骼问题如脊柱疼痛等。水疗曾被广泛地应用于小儿麻痹症的骨骼肌肉后遗症方面的处理, 但随着脊髓灰质炎疫苗的发展, 该病已经几乎在全球消失。因此在美国, 很多拥有治疗池设施的医院发现治疗池的应用极大减少, 因而废除了他们的治疗池。接受过水疗康复技术培训的物理治疗师发现他们没有治疗池可用, 而很多物理治疗培训计划从其教育课程中去除了这些培训。从1950年到1980年, 水疗的应用在美国大幅下降, 甚至许多欧洲的水疗中心也出现了使用的下降。

## 复兴

从20世纪80年代开始,水中运动的应用出现了一次复兴,并不是针对特定疾病的治疗,而是社会对身体健康的重视提高所致。水中运动的流行是因为其对骨骼和关节的影响减少、其固有的娱乐性、以及后继发展的一些具体的水中运动项目。在正规的医学领域内对水中活动的健康益处的了解仍然相当有限。然而,利用水疗进行运动损伤的恢复在某些特定的中心获得了进展,如俄勒冈州的尤金,耐克奥运发展田径项目广泛利用水上设施进行损伤的恢复及田径运动员的交叉训练。医生们比如我也参与了这些项目,并且直接见证了利用水中环境对这些运动损伤治疗的效果。在此时,很少医生认识到水中浸入带给身体的生理效应,因此未能理解水疗对于康复和维持健康的潜在用途。

在二十世纪60年代到70年代之间,当美国发展其航天计划时积极资助对人体失重时的生理效应的研究,从而出现了大量对于浸入的生理效应的基础科学研究。这方面的研究质量非常高,但几乎仅限于出现在航天文献和生理学期刊,而不是医学期刊中。因此,对于浸入给心血管系统、肾脏系统、肌肉骨骼系统和呼吸系统带来的深远效应缺乏医疗意识。当我开始钻研这方面的研究时,水疗应用于传统康复人群,包括脑卒中、脊髓损伤、严重骨折、脊柱疼痛和神经性疾病患者的可能性带给我非常深刻的印象。我在医学期刊上发表了一些论文并开始与医生和物理治疗师读者交谈。逐渐地水疗的应用开始扩展。起初,温水池的可用性形成了很大的限制,用于竞技的游泳池往往对于具有明显运动限制的个体来

说太冷了。随着时间的推移,出现了越来越多的温水池并且水池产业开始研发和销售更小的适合物理治疗实践用的温水池以便购买和安装。

在欧洲,传统的水疗中心实践并没有广泛应用水中运动,而是注重矿泉水浸入产生的被动效应。主动运动并不是惯常的做法,甚至到今天,在许多欧盟国家的水疗中心也较少应用主动运动。但是越来越多的人意识到水中运动的价值,并且很多大型的水疗中心目前利用团队课程和特定的水中运动技巧来治疗骨关节炎和比如纤维肌痛症等慢性疼痛的问题。这些实践正在迅速扩展。

## 目前的水疗实践

### 骨科

骨科和物理医学与康复领域已经迅速地认识到水疗在肌肉骨骼和关节疾病问题处理中的价值,不管水疗是应用于这些问题的保守的非手术治疗还是应用在术后处理。在全膝关节和全髋关节置换术患者术后极早期的康复进程中应用水疗是很常见的。在我们医院,这些病人可能在术后第4天用防水敷料覆盖手术部位后就可以进行第一次水中治疗。但是这么早期的应用并没有得到普遍地接受,有些外科医生坚持要他们的病人等到伤口完全愈合,有研究证明这种延迟是不必要的。对于膝关节、腕关节和肩关节的患者有着特定的水疗方案,在这些领域也有水疗师培训项目。

关节炎性疾病非常普遍地使用温水浸入治疗和水疗。专门为关节炎设计的项目常常得到物理治疗师的应用,同时也有非专业人员带领社区项目。水疗在治疗关节炎患者方面的应用几乎早于有记录的历史并且对这些益处

具有充分的医疗认识,所以这些项目可能是水疗在美国、欧洲以及其他地方最普遍的应用。

### 心血管方面

水疗在心脏康复方面的应用更不普遍,尽管有可靠的研究支持对这些人群应用水疗,同时该应用日渐被接受且实践不断增加。浸入产生心输出量的增加,同时通常降低血压和全身血管阻力,产生心脏效率的增加。因此对心肌梗塞或充血性心力衰竭恢复期病人来说,水疗的应用可以加速恢复,并提供一种有用的治疗技术。

### 呼吸科

浸入产生了呼吸工作负荷的增加,同时改善了膈肌的力学机制,所以水疗不断地获得了在哮喘、慢性肺疾患和其他呼吸障碍患者治疗方面的接受。这样的应用长期以来已经成为欧洲健康水疗中心的治疗组成部分,并且在英国也得到越来越多的应用。这些生理效应对慢性衰弱、开放性心脏手术后、神经性问题如脊髓损伤等的治疗可能产生很大的益处,在这些疾病的患者中呼吸功能也常常受损。

### 神经疾病的治疗

水疗在脑卒中、多发性硬化症以及帕金森病的治疗方面的有效性已经被很好地认识,这些病人可以参加很多水疗项目,不管是在康复医院还是在社区内。水的浮力极大地促进了在这些疾病情况下的移动、平衡训练和渐进力量训练。可能对大脑功能也有中枢性效应,但是在这个领域还需要进一步的研究。

### 运动员的训练和康复

在美国以及欧洲、南美洲和澳大利亚,水疗已被广泛接受为一种加快损伤恢复、保持心肺适能、加速回归运动参与的主要手段。因此,多数大学为他

们的运动队装备了强大的水中运动设施并极好地应用它们。同样，几乎每一支专业运动队都有自己的水上训练和康复设施以供他们的队员使用。在这些国家使用水疗进行交叉训练也很常见，因为水的粘滞性增加了运动的阻力并促进力量的发展，而水的浮力减少了关节的负荷，降低了训练的损伤。

#### 儿科应用

儿童的水疗在美国和欧洲被广泛接受和提供。对瘫痪、青少年类风湿性关节炎和肌营养不良症的益处是巨大的。孩子们会发现在温暖的水环境中

是愉悦的，水的浮力促进了运动，甚至对无力的肢体也是如此，所以水疗非常有利于儿科人群。因此，很多康复机构为儿童设置了水疗项目，支持残疾儿童的组织也常常向他们服务的人群强调水疗项目。

#### 水疗的未来

过去30年里水疗在美国、南美洲、欧洲和澳大利亚出现了一次引人瞩目的重新崛起。水疗对健康和康复益处的医学认知得到了极大的扩展，但仍需进一步扩展。在这些地区的所有国家，

物理治疗实践已经开始把水疗作为可依赖的治疗选择的一个重要组成部分，通过利用社区设施或在治疗场所安装水疗设施来实现。随着这一趋势的增加，一些公司正在创造为特定目的定制的治疗池，其安装和维护不昂贵，增加了水疗设施的可获得性。因为水疗对如此多慢性健康问题的广泛适用性，面对全球不断增长的老年人口，水疗在处理如此多健康问题时有显著的安全性和舒适性，我们期待这种增长会持续以至进入一个更健康的未来。◀ IRED

# Aquatic Therapy: Current Status in the USA and Europe

## Background History

The healing properties of water have been known and utilized throughout global history. Many cultures have made use of these properties as a central feature of their civilizations. The Roman baths served as health and rejuvenation centers. In Europe and the USA spas were built to aid in the processes of health care and healing. Often these spas became a major social focus, and citizens would visit them annually for their health benefits. In Europe, many countries have incorporated them into their health care systems, allowing individuals to visit them with the costs of these visits subsidized by the government. This has not been the case in the USA however.

Aquatic therapies were developed in both Europe and the USA to treat specific diseases, especially arthritis and rheumatic diseases, polio, respiratory disease, and musculoskeletal problems such as spine pain. Aquatic therapy was extensively used to manage the musculoskeletal consequences of polio, but with the development of polio vaccines, the disease has disappeared from nearly all of the globe. As a result in America, many hospitals that had therapy pools as a component of their facilities saw a great reduction in pool usage and eliminated their pools. Physiotherapists who had been trained in the techniques of aquatic rehabilitation found themselves without pool access and many physiotherapy training programs eliminated such training from

their educational curriculum. The use of aquatic therapy in the USA greatly declined during the years from 1950 through 1980, and even many European spas saw reduced utilization.

## The Renaissance

Beginning in the 1980's there was a resurgence of the use of aquatic exercise, not so much for the treatment of specific diseases, but as a result of increased societal emphasis on physical fitness. Aquatic exercise became fashionable because of its reduced impact upon bones and joints, its inherent pleurability, and the subsequent development of a number of specific aquatic exercise programs. Still, within formal medicine

there was quite limited understanding of the health benefits of aquatic activity. However, the use of aquatic therapy for recovery from sport injury gained ground in some specific centers, such as Eugene, Oregon where the Nike Olympic Development program for track and field made extensive use of aquatic facilities for injury recovery and also for cross-training of track and field athletes. Physicians such as myself were involved with these programs, and witnessed first-hand the results of using the aquatic environment for these athletic injuries. At this point, few physicians recognized the physiologic effects of aquatic immersion upon the body, and as a consequence failed to understand the potential utility of aquatic therapy for rehabilitation and health maintenance.

There had been a considerable amount of basic science research into the physiologic effects of immersion during the 1960's and 1970's as the United States developed its aerospace program and aggressively funded research into the physiologic effects of weightlessness upon the human body. This research was of very high quality but existed almost entirely within the aerospace literature and physiology journals, rather than within medical journals. Consequently, there was scant medical awareness of the profound effects of immersion upon the cardiovascular system, the renal system, the musculoskeletal system and the respiratory system. As I began to delve into this research, I was very impressed with the possibilities of using aquatic

therapy for traditional rehabilitation populations including people with stroke, spinal cord injury, severe fractures, spine pain and neurological diseases. I published articles in medical journals and began speaking to physician and physiotherapy audiences. Gradually the use of aquatic therapy began to expand. At first, the availability of warm water pools posed significant limitations, as swimming pools used for competition are often too cold for individuals with significant movement limitations. Over time, more warm water pools became available and the pool industry began to develop and sell smaller warm water pools suitable for physical therapy practices to purchase and install.

In Europe, traditional spa practices had not made extensive use of aquatic exercise, instead focusing upon the effects of passive mineral water immersion. Active exercise was not a common practice, and even today, there is less use of active exercise in many of the spas throughout the European Union. But there is a growing recognition of the value of aquatic exercise and many of the larger spas currently make use of group classes and specific aquatic exercise techniques for the treatment of osteoarthritis and chronic pain problems such as fibromyalgia. These practices are rapidly expanding.

## Current Aquatic Therapy Practices

### Orthopedics

The fields of Orthopedics and

Physical Medicine and Rehabilitation have quickly recognized the value of aquatic therapy in the management of musculoskeletal and joint disease, both in the conservative non-surgical management of these problems as well as in the post-operative use of aquatic therapy. It is quite common for total knee and total hip replacement patients to use aquatic therapy in the very early post-operative course for rehabilitation. In our hospital, these patients may have their first aquatic therapy visit on post-operative day 4, covering their surgical sites with a waterproof dressing. While such early use is not universally accepted, and some surgeons insist their patients await full wound healing, there is research evidence that such delays are unnecessary. There are specific aquatic therapy protocols for knee, hip and shoulder patients, and training programs for aquatic therapists in these areas.

Arthritic diseases are very commonly treated using warm water immersion and aquatic therapies. Programs developed specifically for arthritis are in common use by physiotherapists and there are community programs led by lay personnel as well. The use of aquatic therapies for arthritic patients almost predates written history and there is no lack of medical awareness of these benefits, so such programs are likely the most common applications of aquatic therapy within the USA and Europe as well as elsewhere.

### Cardiovascular

The use of aquatic therapy for cardiac rehabilitation is less common, although there is a substantial research base for use in these populations along with growing acceptance and practice. Immersion produces an increase in cardiac output, while typically lowering blood pressure and systemic vascular resistance, producing an increase in the efficiency of the heart. Thus for patients convalescing from myocardial infarct or having congestive heart failure, the use of aquatic therapy may speed recovery and provide a useful management technique.

### Respiratory

Immersion produces an increase in the workload of breathing, while improving the mechanics of the diaphragm, so aquatic therapy continues to find acceptance for the management of asthma, chronic lung disease and other respiratory disorders. Such use has long been a part of European health spa therapies and is increasing in the United States. These physiologic effects may be of great benefit in the management of chronic debility, post-open heart surgery, and neurologic problems such as spinal cord injury, where respiratory function is often impaired.

### Neurologic Therapies

The effectiveness of aquatic therapy has been well recognized in the management of stroke and multiple sclerosis as well as in Parkinsonism, and

many aquatic programs are available for these patients, both within rehabilitation hospitals as well as within communities. The buoyancy of the water greatly facilitates ambulation, balance training and progressive strengthening in these conditions. There may be central effects upon brain function as well, although research needs to be done in this area.

### Athletic Training and Rehabilitation

In America as well as in Europe, South America and Australia, aquatic therapy has been well accepted as a major means of speeding recovery from injury while preserving cardiorespiratory fitness, speeding return to athletic participation. As a consequence, most universities have robust aquatic facilities for their sports teams and make excellent use of them. Similarly, nearly every professional sports team has its own aquatic training and rehabilitative facility for their players. Cross-training using aquatic therapy is also very common in these countries, as the viscosity of the water adds resistance to movement and facilitates strength development while the buoyancy of the water reduces joint loading, decreasing training injuries.

### Pediatric Use

Aquatic therapies for children are widely accepted and available across the USA and Europe. The benefits are tremendous for cerebral palsy, juvenile rheumatoid arthritis and muscular dystrophies. Children find the warm water environment pleasurable, and the buoyancy of the water facilitates

movement even in weak extremities, so there is great benefit for pediatric populations. As a consequence, many rehabilitation facilities have developed programs for children, and organizations supporting pediatric disability often emphasize aquatic therapy programming for their populations.

### The Future of Aquatic Therapy

The past 30 years have seen a dramatic re-emergence of aquatic therapy within the USA, South America, Europe and Australia. Medical recognition of the health and healing benefits has expanded greatly, but still is in need of further expansion. Physiotherapy practices in all of the nations within these geographic areas have come to rely upon aquatic therapy as an important component of their treatment options, either through making use of community facilities or installing aquatic venues within their practices. As this trend has grown, companies are creating purpose-built therapy pools that are inexpensive to install and maintain, adding further to the availability of aquatic therapeutic facilities. Because of the broad applicability of aquatic therapy to so many chronic health problems, the growing population of aging citizens across the globe, the remarkable safety and comfort of aquatic therapy in the management of so many health issues, one can only expect this growth to continue into a healthier future. 