

Volker Nolte • Wolfgang Fritsch

MASTERS *Rowing*

TRAINING FOR
TECHNIQUE,
FITNESS, AND
COMPETITION

MEYER & MEYER SPORT

Masters Rowing

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Contents

	PREFACE.....	8
	INTRODUCTION	11
1	MASTERS ROWING.....	18
	1.1 Target Groups in Masters Rowing.....	21
	1.1.1 The Competitive Masters Rower	21
	1.1.2 The Fitness- and Health-Oriented Masters Rower	22
	1.1.3 Socialization and Community.....	23
	1.1.4 Balance and Recreation	23
	1.2 Competitions for Masters.....	25
	1.3 The Profile of Competitive Masters Rowers	29
2	SUCCESSFUL AGING AS A MASTERS ROWER	33
	2.1 Aging, Stages of Life and Perspectives of Older Age	33
	2.2 The SOC Model: Optimization Through Selection and Compensation.....	40
	2.3 Sport Activities in Older Age.....	46
	2.3.1 Age-Related Changes in Sport Activities.....	46
	2.3.2 Sport Performance at Older Age.....	50
	2.3.3 The Contribution of Rowing to Successful Aging.....	63
	2.3.4 Rowing Performance at Old Age.....	64
3	LEARNING TO ROW	73
	3.1 How Adults and Older People Learn to Row.....	73
	3.2 Methodological Notes.....	78
	3.2.1 Equipment Requirements and Teaching Organization	78

4	IS THERE STILL ROOM TO IMPROVE TECHNIQUE?.....	102
4.1	General Characteristics of Correct Rowing Technique	106
4.2	Does the Technique of the Masters Rower Differ From That of the Elite Rower?	119
4.3	Is There a Protective Technique for Fitness-Oriented Masters Rowers?	122
4.4	Balance, Movement Coordination and Boat Feel in Older Age	124
4.5	What Exercises Can Improve My Rowing Technique?	125
5	BOAT RIGGING FOR THE MASTERS ROWER.....	144
5.1	What Is the Proper Equipment for Masters Rowers?	145
5.2	What Should Be Considered When Rigging a Boat for Masters Rowers?	147
5.3	How to Rig a Boat for Masters Rowers	149
5.3.1	Oar Design and Measurements	151
5.3.2	Boat Measurements.....	154
5.3.3	Tips for Adjusting the Boats	158
6	TRAINING FOR MASTERS ROWERS.....	161
6.1	General Information on Training for Masters Rowers	161
6.1.1	Physical Requirements for Rowing During Aging.....	163
6.1.2	Load and Strain	164
6.1.3	Loading of the Musculoskeletal System.....	165
6.1.4	Principles for Old Age Sports.....	166
6.2	Training Rowing.....	169
6.2.1	On Water Rowing Training.....	170
6.2.2	Training Areas and Intensities	173
6.2.3	Training Methods – More Differentiated.....	178
6.2.4	Training Programs.....	189
6.3	General Fitness and Supplementary Training for Masters Rowers	196
6.3.1	Additional Strength Training for Rowers Over 40	202
6.3.2	Training on the Rowing Ergometer.....	226
6.3.3	General and Supplementary Endurance Training for Masters Rowers	238
6.3.4	General Coordination Training for Masters	251
6.3.5	Flexibility.....	258
6.4	Functional Support Training.....	266

7 **COMPETITION FOR MASTERS ROWERS 270**

 7.1 Annual Planning for Masters Rowers..... 275

 7.2 Training Planning 276

 7.3 Training Camps 283

 7.4 Preparation for Races..... 285

BIBLIOGRAPHY 291

LIST OF FIGURES..... 297

LIST OF TABLES 300



Preface

Rowing is a passion that has united us for many decades. Although our interest on the water now differs, with Volker still enjoying age-appropriate competitive training leading to quite successful masters racing, and Wolfgang engaging more in coaching master rowers, we continue to share our keen interest in sport research and coach education. Additionally, we look back with fond and inquisitive memories of many years of successful international racing and coaching that provided us with a wealth of personal experiences in our sport, not to forget our academic careers in sport science, particularly in rowing.

We shared over the years many studies and discussions about rowing, which finally resulted in the first edition of our book *Master Rudern – Das Training ab 40* being published 2010 in German. However, it was clear to both of us from the very beginning that this book must also be published in English, and we have always been convinced that an English edition would find its audience. We realize the amazing interest and need from competitive, as well as recreational masters rowers, in the English-speaking part of the world to gain access to a comprehensive collection of information about this topic in one place. We reviewed and corrected our German edition, brought everything up-to-date and translated it into English. This process also included some adaptations to the specific situations of rowing in English-speaking countries, especially North America, but we maintained the basic ideas and structure of our book.

It was very noticeable and surprising at the same time for us that masters rowing – at least in the technical rowing literature – has not been given very much attention, especially as it is enjoying increased popularity. There are a number of forums of discussion, particularly on the internet and also some articles based on personal experiences, but scientific studies that focus on the elder rowers are rare. Instead, many masters rowers and their coaches are left to copy training plans and coaching practices of high-performance rowers. Likewise, many masters rowers try to design their training by remembering their own workout practices that they experienced as high school or university rowers from decades earlier. Boat rigging also tend to work on the “principle of hope” and is often still geared to the glittering times of great flexibility and strong stamina.

Our perspective on masters rowing goes somewhat further. In addition to the training of the many competitive masters, older athletes who may no longer be found at FISA's big international masters events, but who have ambitions to maintain or improve their rowing technique, physical performance and health with the help of rowing practices, have been consciously included in this book. The latter group of masters rowers may be gearing up for smaller competitions with sometimes varying course lengths, or simply enjoying the camaraderie with their rowing friends. Our aim is to contribute to securing the quality of life, the physical performance and independence of all of these older athletes who follow our unique sport.

In this book, we want to provide basic information on how to do, but also expand by investigating masters rowing from a scientific point of view. Of course, we will share our hands-on experiences as rowers and coaches, and present best practices on what to do in our sport. We will go to great lengths to stay close to the practice and thus give all masters rowers, not only the competitive masters, many tips for learning and training. In addition to all this, we would like to pass on some scientific background of masters rowing and the training with older people. This is all done to help masters rowers enjoy this great sport for as long, as healthy, as enjoyable and as successful as possible. Our definition of masters rowers includes not only the ambitious regatta participants in the various age groups who want to achieve a rowing success through systematic training, but all older rowers who want to practice our sport with joy, purposeful and healthy. If masters athletes or coaches of elderly rowers are looking for ways to develop in rowing, they will find lots of tips, information and hints in our book.

In addition, we realize that the increase in the number of participants in competitive masters rowing continues to be unbroken. One clear sign for this is the steady growth in the turnout to national and international regattas of the masters. We will strive to give those rowers valuable information about how they can possibly make their training safer, more effective and even more enjoyable.

The enthusiasm of many adults for rowing and its diverse manifestations has increased enormously. Many clubs offer beginner courses for adults and older people who may not be racing but still want to improve their physical fitness and health by participating in rowing.

Our overall concern is therefore to make a contribution to securing the highest possible levels of quality of life, of general physical performance and of independence in the aging process with the help of rowing.

We both hope that the detailed chapters on "Aging Successfully" and "Learning to Row" – in addition to "Rowing Techniques" and "Training the Master Rowers" – will also be an enrichment for the reader.

The publication of this book has been a heartfelt wish for us for quite some time. All the more, we thank the direct and indirect participants in this book, because without their help the publication would certainly not have happened. First, there are the many master rowers and rowing partners who rowed and trained with us over the years and gave us plenty of inspiration for this book. Also, many volunteered for photo shoots. Your ideas and suggestions have found their way into this book.

In addition, we would like to highlight some of our supporters who have been very helpful as discussion partners and in the preparation of the manuscript, tables, and illustrations: Donald Peterson of the Canadian Center for Activity and Aging, and Charles Rice of the School of Kinesiology at the University of Western Ontario, Maria Martensen as a newcomer in rowing, as well as Julia Sonntag from the Department of Sports Science at the University of Konstanz. Special thanks are due to Liz Evans and Alan Oldham who helped to present the book in its English version.



Introduction

ROWING – PASSION FOR A LIFETIME!

For most rowers, their sport is more than a simple physical activity; it is a form of artistic expression. Rowing introduces participants to a culture that becomes for many, a way of life, something Craig Lambert (1999, p.12) describes so well in his book *Mind over water: Lessons on life from the art of rowing*: "We are out here in the darkness to reveal ourselves, to discover who we are. With the oars, we attempt things that we cannot do, we confront that which is beyond our capacities. *Mind over water*. The shells transport us into the unknown." Many, especially older rowers – both seasoned veterans and late-life beginners – wholeheartedly agree with this author. All by degrees become convinced of rowing's power to convey the essential qualities and abilities that bring meaning to a modern life: strength, endurance, tranquility, balance, coordination, perseverance, team spirit, joy of competition, mindfulness, purposefulness and concentration!

Regardless of their motivation to pick up an oar – or ergometer handle – adult rowing is a transformative experience. The combination of the social aspects of crew and team performance with its high demands on coordination and physicality, all in connection with sophisticated equipment, makes it comparatively unique within the sporting spectrum.



In rowing, adult athletes are known as “seniors” or “masters rowers”. Formerly common terms such as, “old women” and “old men” have happily fallen out of fashion as has “veterans” to a large extent, although this term remains in use for specific age race categories at some United States regattas (e.g. Head of the Charles). Throughout this

book, we will use the term “masters rower”, as this is now the internationally recognized designation for athletes aged 27 years and upwards not racing in the open age category often called “senior”.

Regionally, there are also races offered under the name of “masters” for rowers even below the age of 27 years, to give younger adults who enter the sport a chance to accompany club comrades to regattas and be competitive. Although we recognize this development, this book will focus on adults over the age of about 30 years with their age specific situations and challenges. According to our understanding, this includes rowing as a performance sport under oftentimes very competitive conditions, as well as a demanding fitness activity or as an exercise for recreation and healthy living. Thus, masters rowing can extend over an age span of 50 years and often longer.

Historically, rowing was one of the first sports to offer organized activity and competition programs for all ages from youth up to advanced age. This is not by chance: targeted, continuous pursuit of rowing can counteract, stop and even reverse most of the inevitable aging processes that happen over a life span and many studies confirm the health effects of rowing.

But the benefits of rowing are not just physiological. It improves a person's quality of life in general and has positive effects on the psyche. As a community sport, rowing provides a chance for meaningful social contact along with the shared experience of challenge and growth through common ventures such as traveling to regattas or touring destinations, as well as positive psychological stimuli to increase problem solving and gain self-confidence.

Sports for adults in the middle and later parts of their lives are becoming more and more popular, mirroring broader societal changes. These are caused by shifting demographics of the population, but also by the evolving landscape of both work and leisure. Sport is omnipresent and offers a variety of services particularly for older adults, especially under the premises of health and prevention. In the course of these developments, the number of physically active or sports-oriented adults has increased, while at the same time the diverse range of activities available is rapidly expanding

The authors are in this expanded sense themselves enthusiastic masters rowers, who even after more than 55 years in the sport continue to enjoy the activity, aim for their particular individual goals and (mostly) experience satisfaction. Add to that countless other positive experiences reaching from the sensations of “perfect strokes” with the accompanying “effortless” run of the boat, the wonderful interpersonal interactions, the magnificent experience of being in nature, to the awareness and enjoyment of improved physical performance. This encourages us, the authors, to keep taking on the ever-



increasing demands of our sport whether as coaches, instructors or athletes. We wish to contribute in our own way to the sport we enjoy so much in order for as many adults as possible to experience rowing with the greatest joy and personal satisfaction. In doing so, we are convinced that lifelong sports - especially rowing - have positive effects on health, performance and life expectancy, and thus significantly improve people's quality of life, even as they age.

This conviction is in line with developments in our society that are generally recognizable in sports for adults and older individuals: the "rediscovery of the own body", along with a changing sense of health and fitness; the need for authentic physical activity in the great outdoors; the desire for social connectedness and a sense of inclusion. All of this characterizes the attitudes towards physical activity and the shift in adults' approach to sports.

In the conscious configuration of leisure time and as a separation from the working world, sport has become an important factor in adults' lives, and thus contributes to society's evolving image of the typical "older person". The increasing variety of activities and sports provides tailor-made offers for all kinds of specific interests and goals, not only in terms of different sports and forms of exercise, but also individual motives. Offerings span from competitive performance sports to recreational activities that are geared towards community or nature experiences.



The current trend is for more and more adults to find rowing as their activity of choice through various club and community programs like adult learn-to-row courses or training camps. These individuals progress from learning the basic rowing movements to the intricacies of refining technique and then finally to enjoying all that this sport has to offer. Additionally, many former high school, college and high performance rowers continue in their sport beyond their adolescent years or come back after a number of years of absence from the sport.

Rowing's draw lies in its ability to open up disparate physical, psychological and social experiences at every age and for every level of ability. The sport is particularly attractive because of the way individual experiences can be linked and combined so that no two people experience rowing in the same way. Regardless of which stage in life a rower takes up the sport and the primary motivation – for health, recreation and well-being, or striving for peak physical performance and competition – rowing, with its varied perspectives and opportunities, is an ideal sport for all.

The phenomenon of adult aged competitive and performance sports now stands side by side with the important notion of lifelong physical activity for physical and psychological health. This becomes strikingly obvious when you look at the increasing rates of participation across all ages and ever higher levels of performance at masters rowers' races. The frequency and format of racing opportunities for masters is also on the rise around the world.

The significance of the topic requires a systematic exploration of the various ways that masters rowers learn, practice and train. It is also important that we consider what "successful aging" looks like and rowing's role in this lifelong pursuit.

This book is dedicated to adults of all ages who are practicing this sport and to those wishing to guide and support these masters as coaches and instructors. We are indebted to the vast range of perspectives and motivations that masters seek and find through the pursuit of rowing.



The authors are aware that, by the very nature of rowing as a sport of various experiences, the motivations and perspectives of each adult rower are many and complex. Even a masters rower, who trains and races systematically, may well have in mind the health benefits of the sport and find joy in the pleasures of a rowing tour with friends. On the other hand, the inveterate touring rower is as interested in improving and maintaining their technique as in building and maintaining the social connections afforded by their crew and club.

A Note on the Book's Structure

In this book, we take the perspective of all masters rowers, regardless of whether they are simply using it to pursue good health, or practicing the sport to maintain or improve their physical fitness, or occasionally seeking the outdoors and activities in the boat to relax and decompress, or are life-long, or once again or new competitors. Throughout the book, the authors investigate how rowing, with all its different perspectives, can contribute to "successful aging". To this end, special attention is given to topics related to learning strategies, rowing technique, rigging and sensible rowing training.

The first part of the book (chapters 1 and 2) will focus on the particulars of the physical transformations that accompany aging and how developmental conditions change over the lifespan in the context of successful aging. We will then turn our attention to take a closer look at some masters rower populations of special interest. The findings and evidence presented here serve as the basis for the following chapters.

The second part (chapters 3-5) deals with the subject of adult learning in terms of the rowing movement and considerations on whether and how it is still possible for older athletes to "perfect" their rowing technique - even for resolute competitors. Closely related to this is the individual adaptation of the rowing equipment to age-related restrictions and body dimensions. When discussing the specific physical developments of aging and the goals of masters rowers, the authors make reference, where appropriate, to insights from the experiences of high-performance athletes, something continued in the following chapters.

The third part of the book (chapters 6 and 7) focuses on rowing training for masters age athletes. We seek to answer questions including: What should the rowing training for masters look like? Which aspects should be emphasized? What should be considered regarding load and recovery? How can a rower maintain or increase racing performance or physical fitness over the mid and long term? The book's last chapter concludes with descriptions of planning, execution and design of training, races, regatta schedules and camps.

The final part of the book includes bibliographic references, useful (internet) addresses and a glossary.



Chapter 1

MASTERS ROWING

WHO IS A MASTERS ROWER?

At one time, the transition between performance as an elite athlete and participation as a master was thought to be one of inevitable and rapid decline as an athlete approached "advanced" age in their sport. This was experienced firsthand by one of the authors of this book while trying out for the German National Rowing Team a number of years ago. The National Coach at the time suggested that it would be better for the then 26-year-old rower to look for a career outside of elite rowing since his best performance years were behind him. Coaching efforts and the support of the German rowing system were focused instead on the next generation of younger athletes. This well-intentioned counsel was based on the realization that the average age of the most successful international rowers had been steadily declining; the best research of the day suggesting that humans reach their maximum rowing performance around 25 years of age.



Perhaps coincidentally, this was also the era that saw the official entry age for masters rowing races set at 27 years. It is notable that masters categories start at comparatively different ages across sports. Swimmers can race as masters as early as age 25, triathletes and basketball players have to wait until they are 30 years old, and it is only upon turning 35 that track and field athletes and volleyball players can be considered masters.

Today we know that even older rowers can achieve absolute excellence; indeed, our definition of the age of peak rowing performance must be advanced well beyond the age of 25 years. Sir Steven Redgrave is perhaps the most famous example of this deeper insight, who at the age of 39 won his fifth consecutive gold medal – one gold for each Olympics he attended from Los Angeles 1984 through to Sydney 2000.



This trend has continued in recent decades with ever more highly talented athletes not only participating in elite rowing races, but doing so successfully for far longer. The list of finalists, medalists and even winners – some well over 36 years old – at the World Championships and Olympic Games includes such names as: Ekaterina Karsten (Belarus), Rumyana Neykova (Bulgaria), Duncan Free (Australia), Iztok Cop (Slovenia), Olaf Tufte (Norway), Greg Searle (Great Britain), Lesley Thompson-Willie (Canada), Vaclav Chalupa (Czech Republic), to mention just a few. Jueri Jaanson (Estonia) won the silver medal in the men's double at Beijing 2008 at the age of 42 and in 2019 a 46-year-old James Cracknell (Great Britain) became the oldest winner of Britain's famous University Boat Race following Cambridge's victory over Oxford!

While such athletes are without doubt exceptional, their growing ranks are an indication that there is no fixed "expiry date" on the physical performance required to achieve top rowing results, as long as the athletes stick to an appropriate long-term training regime. In fact, research now suggests that factors such as decreasing motivation, higher vulnerability to injury and personal demands (job, family) have a greater impact on a person's diminishing performance than any age-related decline of physical abilities.

Although they are technically of the eligible age of masters rowers, these older elite athletes are clearly outside the scope of our current volume. **For the purposes of this book, we will define masters rowers as athletes around 30 years of age and older who are neither publically funded, nor full-time members of a high performance program, nor those who subordinate their career or education in the pursuit of high performance objectives.** While masters athletes can compete at quite a high level and participate in organized training at any age, "**successful aging**" in a holistic sense – rather than absolute peak athletic performance – is the main goal; master rowers' training, therefore, should strive to reach this goal in an age-related, meaningful manner.

1.1 TARGET GROUPS IN MASTERS ROWING

1.1.1 The Competitive Masters Rower

For many athletes, it is a natural transition from their time as high-performance rowers in high school, university or club programs into a competitive masters rowing program with little or no interruption. Other masters find their way back to rowing after taking years off from regular training and competing in "their" sport, which they had exercised more or less intensively as adolescents. Not infrequently you also find athletes who have only discovered competitive rowing as adults. The ever-increasing number of regattas specifically geared towards masters, and the continuously rising rates of participation in masters races, bear witness to the great popularity of rowing as a competitive sport for athletes of increasingly older age. These trends can be observed worldwide.

The competitive structure of rowing is divided into age categories to ensure as equal a "field of play" as possible within races. Traditional age categories with a focus on younger athletes are defined by an individual competitor's maximum age (see Tab. 1). The "Senior" category – often referred to as "open" – has no age limitations and is meant to be for rowers competing at the absolute highest levels both domestically and internationally. On top of this, masters rowing has emerged as a competitive system similarly subdivided into age groups, but ones based instead on the minimum age of either the individual rower or crew average in larger events (see Tab. 3). The flexibility inherent in this system allows for a wide range of combinations of athletes of different ages as long as all are above 27 years old.

Tab. 1: Age categories in rowing with their official names

Age	Age Categories in Rowing
Up to 14	Boys and Girls
15 – 16	U 17 or Junior B
17 - 18 *	U 19 or Junior A
19 - 22 *	U 23 (some countries also have the category U 21 = 19 - 20 years)
All ages *	Senior
27+ **	Masters (various age groups) men / women

**Indicates international age categories with official World Championships.*

***There are already in some rowing nations even younger age groups (e.g. 24+). However, no specific reference is made to these age groups in this book.*

Besides the thrill of competition, motivations for participation as masters rowers are as varied as the rowers themselves. Below are some of the main factors that attract adults of all ages to the sport of rowing.

1.1.2 The Fitness- and Health-Oriented Masters Rower

Rowing is an excellent way to maintain and improve fitness and physical health especially well-suited to aging adults. As a low impact, joint-friendly endurance sport, rowing meets the desires of many people wishing to enjoy the health benefits of physical activity, including the prevention of diseases and deficiencies that come with a sedentary lifestyle. Rowing also poses no major risk of injury to older adults when performed with proper technique. In fact, one major cause of injury – falling – simply does not exist in the sport since the rower is already sitting down. Furthermore, rowers can participate year-round in a sport that strengthens so many muscle groups and particularly targets aerobic endurance both on or off the water.



Fitness-oriented masters rowers try to increase their physical performance and their recovery abilities through systematically and methodically planned training. This group of athletes is less interested in measurable increases in competition performance or in specific training aimed towards regatta participation. Nevertheless, these athletes do have a kind of “performance idea” in their vision. Their training primarily serves to achieve individual physiological adjustments such as weight loss, strengthened musculature or improved endurance. At the same time these athletes achieve quite a number of positive psychological experiences, like increasing self-esteem, learning and mastering rowing’s relatively complex technique, finding satisfaction in finishing a particular part of a rowing session, or enjoying a well-running boat and a well-drilled crew.

Primarily **health-oriented masters rowers** have similar goals. These adults seek the ability to continue meeting or exceeding the demands of everyday life as they age. The experience of the activity in itself, moving in nature, the benefits to physical and psychological well-being and strong social contacts are other important motivational factors. For the health-oriented adult, rowing offers a broad variety of activities in the great outdoors. They can meet for single rowing outings, as well as for pleasure tours over several days. Whatever the activity, they can choose their individual physical loads and mental expectations.

1.1.3 Socialization and Community

Rowing as a recreational sport carries with it the possibility to be active in groups with a wide range of age, gender and performance. Thus, it is possible that one can find fun, relaxation and conviviality with friends simply by involvement in this sport.

Rowing is practiced primarily in clubs, which satisfy further social needs of adult members. For example, they provide a meeting place, organize parties and events, and provide a second home for both younger and older rowers.

1.1.4 Balance and Recreation

Rowing is mainly practiced outdoors and many adult rowers feel a special connection to water and nature. Whether they participate in multi-day pleasure tours, short trips or exploration trips by boat, moving on local or unfamiliar water ways offers both relaxation and adventure. Rowing thus also serves as a balance to the everyday and professional life, promoting well-being as an adventure sport and as pure and simple recreation in the activity itself.



Tab. 2: Target groups in masters rowing

	Performance and competitive rowing	Fitness and health rowing	Recreational rowing, pleasure touring, rowing as balance and recreation
Main Motives	<ul style="list-style-type: none"> ▶ Optimizing physical performance relating to age ▶ Competition, regattas, benchmarking 	<ul style="list-style-type: none"> ▶ Physical fitness, rowing as a means to improve health and physical performance ▶ Weight reduction 	<ul style="list-style-type: none"> ▶ Conviviality ▶ Fun ▶ Social connection and links in a club ▶ Group experience ▶ Nature experience
Competitions, Training, Organizational Forms	<ul style="list-style-type: none"> ▶ Regatta travels ▶ Rowing races over various distances ▶ Ergometer races ▶ Training and competitions in other sports ▶ Mostly systematic training in preparation for competitions 	<ul style="list-style-type: none"> ▶ Occasional participation in competitions and pleasure tours ▶ Possibly training and competing in other (endurance) sports ▶ Training according to time restrains and motivation 	<ul style="list-style-type: none"> ▶ Club tours, pleasure tours, excursions ▶ No or almost no competitions ▶ Limited practices in other sports
Training / Rowing Frequency	<ul style="list-style-type: none"> ▶ Regular and systematic training 3-6 per week ▶ Training camps, holiday sports 	<ul style="list-style-type: none"> ▶ Regular / irregular training approx. 1-4 per week ▶ Sometimes holiday sports 	<ul style="list-style-type: none"> ▶ No systematic training ▶ Outings in the boat about 1-3 per week
Importance of the Sport	<ul style="list-style-type: none"> ▶ Rowing plays a very important role and is a priority in life ▶ Very keen interest in the sport and in knowledge relating to training, rowing technique, boat technique and material 	<ul style="list-style-type: none"> ▶ Rowing plays a minor role, but is a vital part of life ▶ Great interest in topics and knowledge about the sport and in connection with fitness, health, rowing technique 	<ul style="list-style-type: none"> ▶ Rowing plays no central role as a sport ▶ Great interest in social events, trips and in the connection of rowing with cultural aspects

	Performance and competitive rowing	Fitness and health rowing	Recreational rowing, pleasure touring, rowing as balance and recreation
Teams / Groups	<ul style="list-style-type: none">▶ Relatively homogeneous performance groups and teams▶ Occasionally changing of selected training partners, also outside the own club	<ul style="list-style-type: none">▶ Heterogeneous as well as homogeneous teams and groups possible▶ Alternating training partners	<ul style="list-style-type: none">▶ Very heterogeneous groups possible, but usually the same groups

1.2 COMPETITIONS FOR MASTERS

Performance-oriented masters rowers try to maintain or improve their competitive performance through targeted and systematic training. The idea of competing is a high priority for these athletes and a major motivation for training. Masters races are governed by the same rules and competition regulations that apply to senior and junior rowing with a few notable adjustments discussed below. According to international regulations, masters rowing includes athletes from age of 27 to the ninth decade of life.



Every year, masters regattas are very popular events worldwide. Organized with great efficiency, racing schedules are usually much denser than regattas for younger rowers and offer plenty of races in short intervals. The international rowing association (FISA) is aware of these developments and for many years has had a standing masters committee, the FISA Masters Rowing Commission, whose purpose and activities are published on FISA's website and reproduced here:

1. Purpose

- 1.1 To oversee and promote masters rowing in all its forms on a national and international basis.

2. Activities

- 2.1 To organize the World Rowing Masters Regatta annually.
 - 2.2 In cooperation with other commissions, establish standard masters classes in other forms of rowing.
 - 2.3 To gather dates and locations of key international masters regattas for the international calendar.
 - 2.4 To publish written information.
 - 2.5 To consult with and advise the Youth Rowing Commission regard the Masters Fund for Youth rowing an the use of the resources of the Fund.
(See www.worldrowing.com)
-

Competition-oriented masters rowing is enjoying growing international popularity and plays an important role within FISA, who organizes an annual worldwide event. Officially named the "World Rowing Masters Regatta", the event is not considered a true World Championships. This distinction, however, is not always present in the minds of some participants, who can – if only in their own minds – become "world champions" with a win in their race. Races are run with all heats being finals; there is no progression to a next round. The result of this is several gold medallists for each boat class and age classification. This annual event enjoys enormous popularity. For example, the 2017 World Masters Regatta in Bled, Slovenia saw 4,700 rowers competing in about 6,000 boats with 18,000 total seats filled.

The international rules of racing for masters rowing are well established and are based on age categories, which begin with the age of 27 as a minimum threshold to compete and then set at different age increments with a minimum average age:

Tab. 3: Age classifications for masters rowers

Category			Development phases (correspond to ...)
A	Minimum age	27 years	"Early adulthood"
B	Average age	36 years or more	
C	Average age	43 years or more	"Middle adulthood"
D	Average age	50 years or more	
E	Average age	55 years or more	"Late adulthood"
F	Average age	60 years or more	
G	Average age	65 years or more	
H	Average age	70 years or more	"Elderly person"
I	Average age	75 years or more	
J	Average age	80 years or more	
K	Average age	83 years or more	
L	Average age	86 years or more	
M	Average age	89 years or more	

There are also “mixed” competitions with equal numbers of women and men in each crew. Male and female coxswains can compete in all races regardless of crew gender. Coxswains also do not fall within the age restrictions and are therefore not counted in the calculation of the average age of a crew. Regardless of age, rowers are limited to only two races per day. Lightweight classes are only offered locally, but not yet internationally.

Master rowers typically race side by side over 1,000 m on a multi-lane buoyed course. As the format for the World Rowing Masters Regatta, this is the international standard. Shorter sprint races can be up to 500 m. Longer “head races” normally around 5 km (3 miles) are conducted as time trials with boats starting one after another usually on a narrower waterway such as a river.



Where numbers warrant, masters races of different age groups can be run as a combined heat. Most national rowing federations have developed their own system of handicaps in order to compare the relative performances of one crew relative to another in a different age group. Regardless of which system is used, the relative accuracy of these numbers is most reliable when comparing neighboring age groups. If required, three neighboring age groups could be run together. The following table published by the German Rowing Federation is valid for 1,000 m distance races and indicates the length of time an older crew needs to start ahead of a crew of a neighboring age category to create a fair race.

Tab. 4: Time advantage in seconds for 1,000 m distance races of a crew relative to a crew of the neighboring age category

Age Category	A	B	C	D	E	F	G	H	I	J	K
Boat Class											
4x/8+	0.0	2.0	3.0	5.5	5.0	6.0	7.0	8.0	9.0	10.0	12.0
2x/4+/4-	0.0	2.0	4.0	6.0	5.5	6.5	8.0	9.0	10.0	12.0	14.0
1x/2-	0.0	2.0	4.5	7.0	6.5	7.5	9.0	10.0	11.0	13.0	16.0

For example, if a Masters-C-4x, a Masters-D-4x, and a Masters-E-4x are going to start in the same race; then the Masters-E-4x will start 5 seconds before the Masters-D-4x, which in turn will be starting 5.5 seconds ahead of the Masters-C-4x. So, the Masters-C-4x ends up waiting a total of 10.5 seconds after the Masters-E-4x started. The winner is the one who is the first to cross the finish line.

The presented handicap table that we used because of its simplicity is only one of numerous tables that you can find. Certain regatta organizations use their own handicap tables to accommodate for specific distances or the specific local situation (e.g. current or course layout). Handicap numbers in all these tables are very similar and are based on related premises to account for the age-related differences.

Success in the masters categories can only be achieved with extensive and deliberate training, which is hardly inferior to that of the top senior rowers. It is not uncommon for ambitious and well-trained non-rowers to try their hand at ergometer competitions, since the (rowing) technical requirements take a back seat to raw physical abilities. Nevertheless, these competitions and the comparative scores provide good feedback for the performance-oriented masters rower.

Ergometer racing is a special form of rowing competition. National and international records are maintained for different age, weight and gender categories. The status of indoor rowing has also risen in recent years with FISA's introduction of a World Rowing Indoor Championships, granting official "World Champion" status to winners in each of these categories.

1.3 THE PROFILE OF COMPETITIVE MASTERS ROWERS

For years, the World Rowing Masters Regattas has been among the world's largest rowing competitions. Participation at this international regatta, ranging from between 2,000 and 4,700 rowers annually, is greatly encouraged by an expansive programme that now includes eleven different age groups and 17 different boat classes.

Seiler (2003) surveyed over 1,000 masters rowers through the FISA website. Thirty percent of respondents were women aged between 27-68 with a mean age of 43 years; and 70% were men aged between 27-83 with a mean age of 47 years. The majority of those surveyed were from Europe, followed by North America and Oceania. The study found that 41% of female respondents had their first competitive experience in the masters category, while 55% of the male and 35% of the female subjects were former elite senior rowers.