



# Annual Report 2018



**GLA:D**<sup>®</sup>  
DENMARK

ValueBased  
HealthCare

Winner  
Prize 2019

# GLA:D® Annual Report 2018



## GLA:D®



Treatment for knee and hip osteoarthritis



In Denmark since 2013



GLA:D® has been implemented internationally

Good Life with osteoArthritis in Denmark (GLA:D®) is an initiative from the Research Unit for Musculoskeletal Function and Physiotherapy at the University of Southern Denmark.

GLA:D® represents an evidence-based treatment plan for knee and hip osteoarthritis consisting of patient education and neuromuscular exercise.

GLA:D® facilitates the implementation of the national clinical guidelines and was launched in Denmark in 2013. Almost 350 private practice clinics and municipal rehabilitation centers deliver GLA:D programs to approx. 10,000 patients each year. The initiative has also been implemented in Australia, Canada, China and Switzerland.

Over the last six years, close to 40,000 Danish patients have participated in a GLA:D® program.

The GLA:D® Annual Report 2018 presents an overview of the results that patients have achieved, including reduced pain, reduced intake of painkillers, improved physical function and quality of life.

Happy reading!



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# What is GLA:D<sup>®</sup>?



## Elements of GLA:D<sup>®</sup>



Patient education  
2 x 1 ½ hours



Supervised neuromuscular  
exercise  
2 times a week for 6 weeks

## Access to GLA:D<sup>®</sup>



The patient is able to self-  
refer to a GLA:D<sup>®</sup> unit



The patient can be referred to  
a GLA:D<sup>®</sup> unit by their GP or by  
an orthopedic surgeon

### Three mandatory elements of GLA:D<sup>®</sup>:

- Education of physical therapists in delivering patient education and neuromuscular exercise training,
- Two sessions of patient education and a minimum of 6 weeks of neuromuscular exercise for patients at the individual GLA:D<sup>®</sup> units,
- Registration of patient data in the national GLA:D<sup>®</sup> registry.

### GLA:D<sup>®</sup> patient objectives

- Increased physical function
- Reduced pain
- Reduced intake of painkillers
- Improved quality of life

The aim is that this will result in a decrease in health care visits and thus lower costs for the individual patient and society.

See [presentation of GLA:D<sup>®</sup>](#).

### Access to GLA:D<sup>®</sup>

Patients with hip or knee osteoarthritis may join the GLA:D<sup>®</sup> program through

- GP referral,
- referral from an orthopedic surgeon,
- self-referral to a GLA:D<sup>®</sup> unit.

### GLA:D<sup>®</sup> aims to

accelerate implementation of the national clinical guidelines into clinical practice, and the overall objective is to ensure

- that all patients with osteoarthritis have equal access to evidence-based treatment irrespective of place of residence or financial situation,

- surgery is considered only when conservative treatment measures have failed.

# Before GLA:D®



Photo: Jørn Ungstrup © GLA:D®



## X-ray

Just under 90% of the knee and hip patients reported that they had x-rays taken of their joints prior to commencing the GLA:D® program. More than 90% of those stated that the x-ray showed osteoarthritis.

The number of patients who have had x-rays within the last six months increases with time. In 2013, 40% of the knee patients and 54% of the hip patients reported having had x-rays taken of their joints within the last six months compared to 63% and 66%, respectively, in 2018.

This in spite of the fact that osteoarthritis may be diagnosed clinically without the use of x-ray and that x-ray is only relevant when surgery is considered or differential diagnoses cannot be excluded.

## Previous visits to the physiotherapist

A total of 33% of knee patients and 42% of hip patients reported that they have previously visited a physiotherapist because of the joint problems. These numbers have fallen slightly over the years.

Prior to commencing the GLA:D® program, half the patients reported that they had received advice on the importance of physical activity and exercise.

## Advice on weight loss

Among weight loss candidates \*, 41% of the knee patients and 32% of the hip patients had received

\* Working in collaboration with the patient, the GLA:D® therapist will assess whether weight loss is relevant

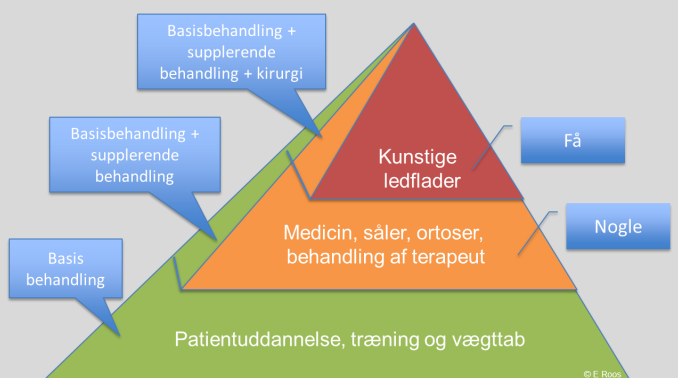
weight loss advice prior to commencing the GLA:D® program.

## Previous surgery

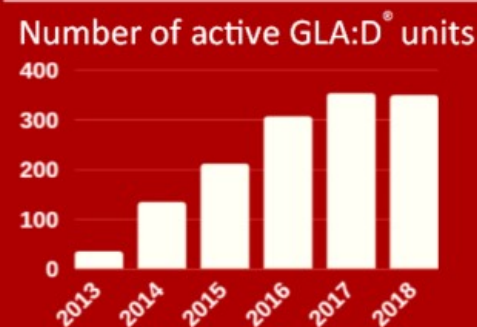
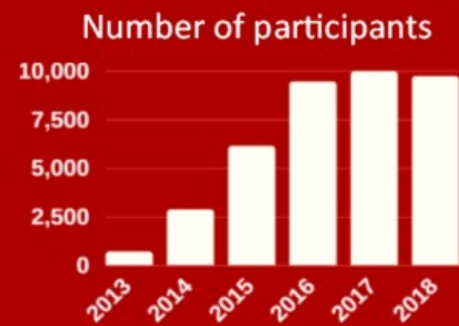
28% of the knee patients and 3% of the hip patients reported having had surgery of their knee or hip in the past. The most common procedures among the knee patients include arthroscopic meniscus repair, knee arthroscopy and removal of loose fragments of bone or cartilage. A few hip patients have had joint replacement and a few have had surgery due to proximal femoral fracture.

## National clinical guidelines for treatment of knee/hip osteoarthritis:

All patients should be offered the first line treatment, some may need supplementary treatment, while only 10-15% need surgery in the form of joint replacement.



# GLA:D® all over Danmark



## GLA:D® is available in all parts of Denmark

In 2018, 349 GLA:D® units, including 29 municipal rehabilitation centers, offered GLA:D® programs.

The units offering GLA:D® programs changes slightly from year to year. From 2013 to 2018, a total of 403 units, including 35 municipal rehabilitation centers, offered GLA:D®.

A total of 85% of the programs were available at private clinics, whereas the rest were offered by municipal rehabilitation centers. Municipal rehabilitation centers are accounting for a slightly increasing proportion of patients. The municipalities of Roskilde and Copenhagen rank as the two busiest GLA:D® units.

From 2013 to 2018, SDU held 17 courses for 1,255 clinicians.

## 350 units offer GLA:D® to almost 10,000 patients each year

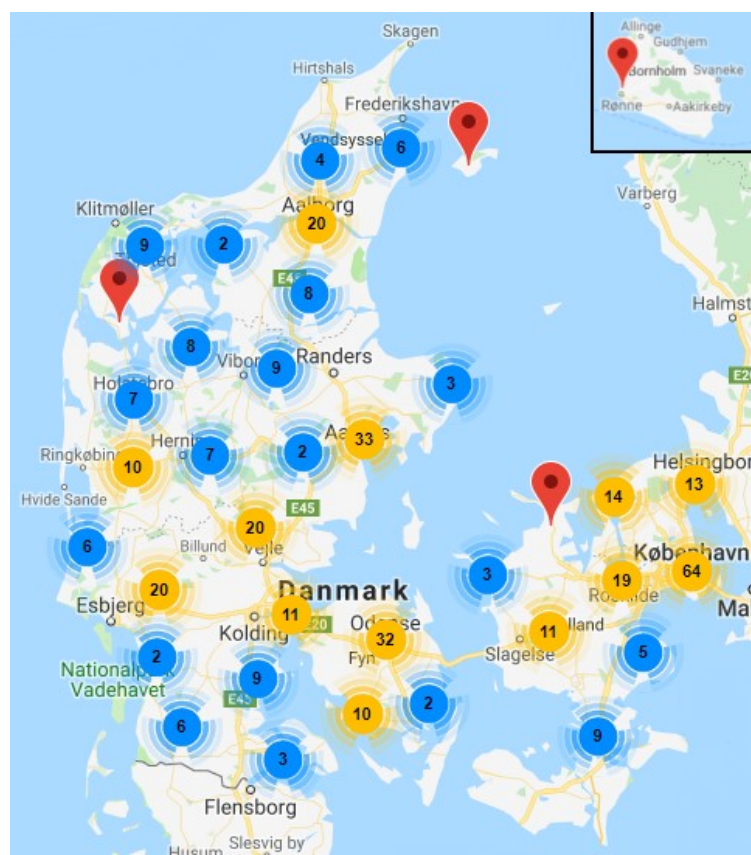
### Almost 40,000 patients

From 2013 to 2018, 38,748 GLA:D® programs were commenced. The annual number of GLA:D® patients increased from 2013 to 2016 and has now stabilized at about 10,000 patients.

## High degree of participant satisfaction

After completing the GLA:D® program, nine out of ten indicated that they are pleased or very pleased with GLA:D®. Also, nine out of ten stated that they apply what they have learned from GLA:D® at least once a week.

Geographical location of active GLA:D® units



# Who participated in GLA:D®?



## Sex and age

A total of 71% of the GLA:D® patients were women and 29% were men. However, the number of men seems to be on the rise.

The average age was 65.1 years and is slowly increasing. The patients were between 15 and 97 years old. On average, the hip patients were a bit older than the knee patients.

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The typical GLA:D® participant is a 65-year-old, overweight woman with knee pain

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## Knee and hip

Most GLA:D® participants reported the knee as their primary problem and fewer reported the hip as their primary problem (75% vs. 25%).

## Symptom duration

Knee patients had an average duration of symptoms of 3.5 years, while hip patients reported having had symptoms for 2 years and 9 months when they commenced the GLA:D® program. Each year, we see a significant decrease in the mean duration of

symptoms prior to GLA:D®. Knee patients have seen a decrease in symptom duration from 6 years to 2 years and 9 months from 2013 to 2018 and hip patients have seen a decrease from 4 years and 2 months to 2 years and 4 months.

## Overweight

Knee patients had an average BMI of 28.8 and hip patients 27.1. A total of 75% of the knee patients and 63% of the hip patients were overweight.

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Knee patients typically have longer symptom duration and more are overweight

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## Previous injury and other diseases

Half of the knee patients and one third of the hip patients had a history of previous knee/hip injury. Other diseases are common. One in three was suffering from high blood pressure. Heart and lung diseases or diabetes were reported by 6-8% of the patients.

# Results after GLA:D®



Photo: Jørn Ungstrup © GLA:D®

	Knee	Hip
Pain	- 27 %	- 23 %
Medication	- 29 %	- 23 %
Walking speed	+ 10 %	+ 10 %
Quality of life	+ 12 %	+ 9 %

## Reduced pain

After GLA:D®, the average knee/hip pain intensity decreased by 27% (from 47.2 to 34.3 mm on VAS 0-100) for knee patients and 23% (from 46.8 to 36.2 mm on VAS 0-100) for hip patients.

## Reduced pain and intake of painkillers, improved physical function and quality of life

### Reduced intake of painkillers

After GLA:D®, the number of patients reporting having used either paracetamol, NSAID or opioids/opioids-like medications within the past three months fell by 29% for knee patients (from 63 to 44%) and by 23% for hip patients (from 66 to 51%).

The number of patients reporting having used opioids/opioids-like medications within the past three months fell from 7 to 4% for knee patients and from 7 to 5% for hip patients.

## Improved physical function

For both knee and hip patients, the average walking speed increased by 10% from 5.0 km/h before GLA:D® to 5.5 km/h after GLA:D®. Before GLA:D®, 1.9% of the patients used walking aids during the functional test and after GLA:D®, this number had fallen to 1.4%.

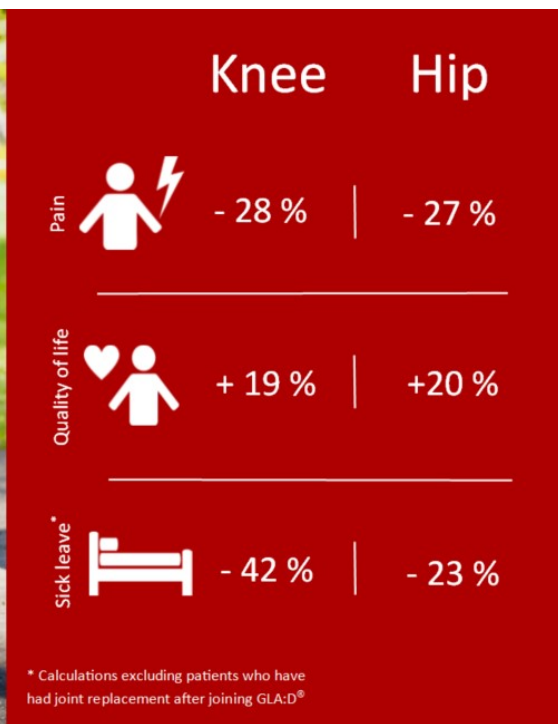
## Higher quality of life

After GLA:D®, average joint-related quality of life increased by 12% for knee patients (KOOS QOL from 45.5 to 51.4) and 9% for hip patients (HOOS QOL from 47.5 to 52.3).

## Compliance in GLA:D®

8 out of 10 attended both education sessions and 8 out of 10 participated in at least 10 group-based exercise sessions.

# Results 1 year after GLA:D<sup>®</sup>



## Reduced pain

The reduction in pain was maintained one year after commencement of the GLA:D<sup>®</sup> program. The knee patients experienced an average pain reduction of 28% (from 47.2 to 34.1 mm on VAS 0-100) and the hip patients experienced an average pain reduction of 27% (from 46.6 to 33.9 mm on VAS 0-100) compared with before GLA:D<sup>®</sup>.

## Reduced pain, higher quality of life and fewer sick leaves

### Higher quality of life

One year after commencing the GLA:D<sup>®</sup> program, patients reported a further improvement in average joint-related quality of life. Knee patients reported a 19% improvement (from 45.8 to 54.6 KOOS QOL) and hip patients a 20% improvement (from 47.8 to 57.8 HOOS QOL) compared with before GLA:D<sup>®</sup>.

### Fewer sick leaves

Among the knee patients who had not undergone joint replacement surgery during the follow-up period, the number of joint-related sick leaves within the last year fell by 42% from 960 knee patients before GLA:D<sup>®</sup> to 561 one year after commencement of the GLA:D<sup>®</sup> program.

Hip patients who had not undergone joint replacement surgery during the follow-up period saw a 23% fall in the number of joint-related sick leaves within the last year. The number fell from 144 hip patients before GLA:D<sup>®</sup> to 111 one year after commencement of the GLA:D<sup>®</sup> program.

### Patients who had joint replacement

After one year, 893 knee patients (8%) and 663 hip patients (17%) reported having undergone joint replacement surgery after joining GLA:D<sup>®</sup>. The analyses have been repeated excluding patients who have had joint replacement and only sick leave was significantly affected by this. Therefore, the analysis excludes patients who have had surgery.



# GLA:D<sup>®</sup> in 2018



## GLA:D<sup>®</sup> international

2015: GLA:D<sup>®</sup> Canada

2016: GLA:D<sup>®</sup> Australia

2017: GLA:D<sup>®</sup> China

2019: GLA:D<sup>®</sup> Switzerland

### GLA:D<sup>®</sup> goes international

GLA:D<sup>®</sup> has been implemented in Australia, Canada, China and Switzerland\*, and in 2018, the first meeting of the international network was held in Liverpool. [An article](#) describing the implementation of GLA:D<sup>®</sup> in an international context and the first [results from Canada](#) have been published. The results found in Canada correspond to the results found in Denmark.

### Certification of course participants

In 2018, certification was introduced at the GLA:D<sup>®</sup> courses. Course participants must pass two exams that test their knowledge of the theoretical foundation of GLA:D<sup>®</sup> as well as the procedures and practical elements of GLA:D<sup>®</sup>. Certification has been introduced as a quality assurance measure.

### Evaluation of GLA:D<sup>®</sup> offered by the Municipality of Hvidovre

The National Institute of Public Health, SDU, has made an [evaluation of GLA:D<sup>®</sup> offered by the Municipality of Hvidovre](#). The evaluation looks at recruitment of participants, among other things, and shows that the participants experience reduced pain and that the participants generally are positive towards the program.

\*GLA:D has been implemented in Switzerland in 2019

### Launch of GLA:D<sup>®</sup> Back

The pragmatic implementation model developed in GLA:D<sup>®</sup> was used to initiate and implement a GLA:D<sup>®</sup> Back initiative. In 2018, GLA:D<sup>®</sup> Back held 9 courses for more than 500 clinicians at SDU. [A number of scientific articles](#) have been published and describe the development of the concept, including patient education and supervised exercise therapy tailored to back patients, as well as the first findings.

### Research based on data from the GLA:D<sup>®</sup> registry

A frequently asked question is whether GLA:D<sup>®</sup> is relevant for patients who are already physically active. [Research based on the GLA:D<sup>®</sup> registry](#) shows that the decrease in pain after GLA:D<sup>®</sup> is not associated with the level of physical activity prior to GLA:D<sup>®</sup>. Therefore, it may be concluded that GLA:D<sup>®</sup> is relevant for patients irrespective of their level of physical activity.

Knee patients with a history of previous joint injury represent a special sub-group, and PhD student Pætur Mikael Holm examined this group and presented his findings at the OARSI 2018 World Congress. The group distinguishes itself from the rest by being younger, more often male, having longer symptom duration, lower quality of life and a higher level of physical activity than knee patients without previous injuries.

# Contact GLA:D®



## Contact



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Support for clinicians:  
[gladsupport@sdu.dk](mailto:gladsupport@sdu.dk)

### Data basis

The analyses included in this Annual Report are based on data from the GLA:D® registry collected from 29th January 2013 up to and including 31st December 2018. A total of 87% of the patients who have completed the first visit at the physical therapist filled in the patient questionnaire. After completion of the treatment programme, the response rate was 75% and 12 months after the first visit, the response rate was 60%. The response rate for the physical therapist's form after completion of the treatment plan was 64%.

The analyses of results after GLA:D® are based on programs that include data from before and after the treatment. Only patients who were not retired or on early retirement both before and after GLA:D® are included in the sick leave analysis.

### Interpretation of results

The analyses included in this Annual Report are entirely descriptive and the results should be interpreted with caution. The data are based on validated questionnaires, objective functional tests and questions whose validity has not yet been exami-

ned. We have strived to achieve as high validity in data collection as possible under the given circumstances, where data are collected in clinical practice without optimal control. It cannot be ruled out that some data may be associated with uncertainty.

To rule out competing causal factors, the analyses have been repeated excluding patients who have had joint replacement surgery during the follow-up period. Consequently, the most obvious competing causal factor has been taken into account. The analyses do not involve a control group, and therefore it is possible that other factors than the GLA:D® program may have affected the results.

The majority of GLA:D® participants are people who are able and willing to pay for a treatment plan in a private clinic and who are able to attend appointments at the clinic. Consequently, it cannot be ruled out that the composition of the patient population may have affected the results. All in all, the generalisability of the results seems acceptable in relation to knee/hip osteoarthritis patients who are able and motivated to participate in GLA:D®; however, considering the above limitations.

This Annual Report has been prepared by: Dorte Thalund Grønne, Ewa Roos and Søren Thorgaard Skou, GLA:D®, Research Unit for Musculoskeletal Function and Physiotherapy, Department of Sports Science and Clinical Biomechanics, SDU, June 2019.  
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# ValueBased HealthCare

*Winner  
Prize 2019*

The VBHC Prize is a prestigious, international prize awarded to inspiring initiatives that have adopted a fundamentally new line of thinking in creating excellent patient value. Implementation is key in the prize.

GLA:D® won the VBHC Prize 2019, beating more than 170 other projects from all over the world. See [video from the award show](#).

Learn more about the [VBHC Prize](#).

