# Contents

**Colofon and Preface**  
03

**Introduction to the Netherlands**  
06

**Netherlands Orthopaedic Association (NOV)**  
13
- Message from the president  
13
- Facts and organization chart  
14
- Mission  
16
- Dutch Arthroplasty Registry (LROI)  
19
- CORE and Science agenda initiative  
22

**Orthopaedic research in the Netherlands**  
24
- University Medical Centers  
25
- Public-private partnerships collaboration  
27
- Best practices  
28

**Orthopaedic giants of the Netherlands**  
29
- Klaas de Groot  
29
- Rik Huiskes  
30
- Tom Slooff  
31

**Guest Nation: the Netherlands @ORS2019 Annual Meeting**  
32

**Useful links**  
42
Preface

Dear reader,

This booklet aims to introduce the Netherlands Orthopaedic Association (NOV) to the general public at the 2019 ORS Annual Meeting in Austin TX, USA.

This booklet summarizes an introduction to the Netherlands, structure and activities of the Netherlands Orthopaedic Association and the Dutch Arthroplasty Registry (LROI) and insight in the Dutch orthopaedic research environment.

The primary reason for the compilation of this book is the fact that sharing information is the first step to mutual understanding, a change to learn and building further collaboration.

This book is by no means intended as an comprehensive overview but aims to raise awareness and stimulate discussion in a fun and concise way.

We trust you will find this a useful addition to your clinical practice and education.

Sincerely yours,

Netherlands Orthopaedic Association Ambassadors @ ORS 2019 Annual Meeting
Ambassadors @ORS2019

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Introduction to the Netherlands

Facts & figures

Population: 17.08 M

Surface area: 41,528 km² (18.41% water)

Density: 488/km² (highest in the European Union)

Capital city: Amsterdam

Government: The Hague

Official language: Dutch

Government: Constitutional monarchy - parliamentary democracy

Religion: 44% no religion, 19% Protestant, 29% Roman Catholic, 6% Muslim

Currency: Euro

Highest point: 323 m (Vaalserberg, Limburg)

Lowest point: -12.8 m below sea level
Introduction to the Netherlands

Facts & figures

One country: the Netherlands
Citizens: Dutch
12 provinces:
- Drenthe
- Flevoland
- Friesland (Fryslân)
- Gelderland
- Groningen
- Limburg
- North Brabant
- North Holland
- Overijssel
- South Holland
- Utrecht
- Zeeland

Additionally some Island in the Caribbean

To learn more in a fun way, please visit:
https://www.youtube.com/watch?v=eE_IUPInEuc

the difference between Holland & the Netherlands
Introduction to the Netherlands

Clogs, dikes, tulips & windmills ... and a whole lot more!

The Netherlands is a constituent country located in Western Europe and with territories in the Caribbean. It shares a border with Belgium & Germany. >25% is located below sea-level. The Netherlands is a constitutional monarchy and the chief of state is the king. The House of Oranje-Nassau has governed the Netherlands since 1815. King Willem-Alexander was crowned in 2013.

The Netherlands is famous for liberal social policies, maritime trading traditions, battles to hold back the sea, robust multiculturalism and leading in technological communications. Resulting Dutch lifestyle is a mosaic of cultural blend.

The Netherlands has a mixed economic system which includes a variety of private freedom, combined with centralized economic planning and government regulation. Netherlands is a founding member of the European Union (EU)

The Netherlands consistently ranks among the top places in the world to live and work. The country may be small in size, but is the world’s second largest exporter of agricultural products. Living standards consistently rank high in the OECD’s Better Life Index, and the Netherlands has the fourth best work-life balance and high levels of employment and household wealth. Dutch children, likewise, are ranked as the happiest in the developed world, topping two surveys conducted by UNICEF.

The Dutch are creative, open minded, informal and pragmatic. They are also rather direct, honest and open in their dealings with others. Dutch people ‘like to be as normal as possible’ according to the Dutch saying ‘just act normal, that’s crazy enough’. The Dutch are known for their tolerant attitudes towards topics such as abortion, euthanasia and (soft) drug use.

The most popular sports in the Netherlands are football, hockey, tennis, cycling, golf, volleyball, korfbal, handball, swimming and ice-skating. Dutch football and speed skating especially enjoy a worldwide reputation.
Introduction to the Netherlands

Fun facts

• More than a quarter of the Netherlands is below sea level
• Dutch people are the tallest in the world
• The Netherlands is the most densely populated nation in Europe
• Flat as a pancake, highest point 323 m above sea level
• Amsterdam is built entirely on poles
• Tulips originated in Turkey
• The Dutch love their coffee
• 86% of Dutch speak English as a second language
• the Nederlands is the largest exporter of beer in the world

To learn more in a fun way, please visit:
https://awesomeamsterdam.com/10-fun-facts-about-the-netherlands/
Introduction to the Netherlands

Top inventions of the Netherlands...

- The submarine
- The telescope
- The microscope
- The eye-test (Snellen chart)
- The fire hose
- The speed-camera
- The cassette tape
- CD, DVD, the laser disc and Blu-Ray
- Bluetooth and WIFI
- Artificial kidney (Kolff)

To learn more in a fun way, please visit: https://www.iamexpat.nl/lifestyle/lifestyle-news/10-important-dutch-inventions
Introduction to the Netherlands
Culinary inventions of the Netherlands... Treat or threat??

To learn more in a fun way, please visit: https://en.wikipedia.org/wiki/Dutch_cuisine
Dear colleagues,

On behalf of the Netherlands Orthopaedic Association (NOV) and the Dutch Arthroplasty Registry (LROI), I would like to congratulate the Orthopaedic Research Society (ORS) with this ORS 2019 Annual Meeting.

We are honored and thrilled to be present at this outstanding event as a guest nation and welcome all participants to our NOV session and meet you in our NOV booth.

We would very much like tell you about our activities in order to learn from all your expertise and experience.

We thank the Orthopaedic Research Society (ORS) full heartedly for this fine opportunity.

We are very delighted to be here and look forward in meeting you all!

Sincerely yours,
Hans Andre Schuppers, president NOV
Netherlands Orthopaedic Association (NOV)

Facts

- Founded in 1898
- 1,450 members (750 orthopaedic surgeons, 250 residents; 97% coverage)
- Board (7 members), Bureau (15 professionals)
- 15 Working groups (experts)
  * Hip, knee, spine (DSS), shoulder/elbow, hand/wrist, foot/ankle
  * Trauma, Biotechnology, Sports, Overseas, PA/NP, Paediatrics
  * Research/Methodology, Infections, Oncology
- 14 Committees among them 4 key committees
  * Education & Training
  * Quality
  * Research & Innovation
  * Professional interest
Netherlands Orthopaedic Association (NOV)

Organizational Chart
Netherlands Orthopaedic Association (NOV)

Mission: “Orthopaedics keeps the Dutch moving (i.e. active & alive !)”

Three major goals:

1. Deliver high level quality patient care
   - Knowledge development (research; CORE)
   - Knowledge dissemination (training, education, guidelines)
   - Decide together with the patient
   - Accessibility of information

2. Be accountable
   - Develop a quality/monitoring system: register, classify
   - Monitor orthopaedic care: analyse outliers, audit hospitals

3. Take care of the professional interest of the orthopaedics
   - Professional interest/syndicat
   - Manpower planning
   - Professional development
   - Develop networks
   - Public relations
Netherlands Orthopaedic Association (NOV)

Goal 1: Deliver high level patient care
Structure workgroups

How do we achieve this?

- Knowledge development (research)
- Knowledge dissemination (training, education, guidelines)
- Decide together with the patient
- Accessibility of information
Netherlands Orthopaedic Association (NOV)

Goal 2: Be accountable

How do we achieve this?

- Develop a quality/monitoring system: register, classify
- Monitor orthopaedic care: analyse outliers, audit hospitals
- Dutch Arthroplasty Registry (LROI) www.lroi.nl
The Netherlands Orthopaedic Association (NOV)

Dutch Arthroplasty Registry (LROI)

www.LROI.nl

- Digital quality register of orthopaedic implants established in 2007.
- 100% National coverage
- Completeness: 99% hip, 99% knee, 94% shoulder, 92% ankle and 88% elbow
- Contributes to the improvement of orthopaedic care in the Netherlands.
- Orthopaedic departments are able to compare the results of the hip and knee prostheses inserted in their hospital to the national data through the LROI dashboard.
- LROI is important for the traceability of joint implants, for patient safety. In case of a problem concerning a prosthesis.

**current registrations**

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<tr>
<th>Joint</th>
<th>Total</th>
<th>Hip</th>
<th>Knee</th>
<th>Ankle</th>
<th>Finger CMC1</th>
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<tbody>
<tr>
<td>Total</td>
<td>682,982</td>
<td>375,949</td>
<td>191,295</td>
<td>681</td>
<td>348</td>
</tr>
<tr>
<td>Shoulder</td>
<td>15,682</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elbow</td>
<td>871</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wrist</td>
<td>156</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Netherlands Orthopaedic Association (NOV)
Dutch Arthroplasty Registry (LROI)

Year reports can be found at https://www.lroi.nl/publicaties/jaarrapportage

Downloads can be found at https://www.lroi.nl/downloads
Netherlands Orthopaedic Association (NOV)

Goal 3: Professional profiling & development

How do we achieve this?

- Professional interest/syndicat
- Manpower planning
- Professional development
- Develop networks
- Public relations
Netherlands Orthopaedic Association (NOV)

CORE and science agenda initiative

- CORE = Consortium Orthopedic REsearch: a national network for initiating and prosecuting scientific research in the field of orthopedics; from facilitating to supporting, evaluating, communicating and implementing. A setup like this is rather unique in the world!

- The aim is to further increase the quality of orthopedic treatment, with improvement of efficiency and efficiency also being important focal points.

- The NOV organizes CORE meetings. We agree on the subjects that we work on and who are going to be involved in this. Topics of the scientific agenda are decided by all NOV members.

- In the future there will be quarterly meetings where we will discuss the starting and ongoing studies, as well as rejected proposals. Knowledge and experiences about the care evaluation research are exchanged here.

A list of current projects: https://www.orthopeden.org/wetenschap/onderzoeksprojecten

Scientific agenda: https://www.orthopeden.org/kwaliteit/agenda-zorgevaluatie
Netherlands Orthopaedic Association (NOV)

CORE and science agenda initiative projects

- LEAK study; research into the best treatment of wound leakage in a hip or knee prosthesis. Dutch version
- DART study; research into the cost-effectiveness of surgical treatment versus plaster in distal radius fractures in the elderly.
- PATIO; stands for Physiotherapeutic Treat-to-target Intervention after Orthopedic surgery; a cost-effectiveness study (after placing hip or knee prosthesis).
- APOLLO; this trial evaluates the surgical approach of a head and neck prosthesis in a hip fracture.
- FRAIL HIP; to set up a multicenter study on the non-operative treatment of the vulnerable, institutionalized elderly patient with a hip fracture.
Orthopaedic research in the Netherlands

- University Medical Centers
- Technical Universities
- Orthopaedic departments
Orthopaedic research in the Netherlands

University Medical Centres

- Positioned on the intersection of medical education, (bio) medical research and patient care with a distinct public mission

- Three core responsibilities
  * Teaching and training
  * Basic and clinical research
  * (Tertiary) patient care

Source: www.nfu.nl

NFU-081132
Public-Private Partnerships

Combine technology push with market pull

- PPPs are especially suited to the life sciences, with their long development horizon, multidisciplinary nature and collaborative, “open innovation” paradigm.
Public-Private Partnerships

Combine technology push with market pull

- The Dutch PPPs landscape of the life sciences— the width per sector indicates the relative PPP investments. Between 2003 to 2007, about EUR 5 billion was committed to PPPs in the Netherlands. Some 40% of it, EUR 2 billion, falls within four sectors impacted by the life sciences: food, health, agriculture and chemicals & energy
Orthopaedic research in the Netherlands

Best practices

Please view the prepared slide show on the Dutch Orthopaedic Association (NOV) booth during ORS 2019 Austin, TX, USA
Orthopaedic giants of the Netherlands

Klaas de Groot (born 3 November 1940, Bergen, Limburg) is Emeritus Professor at the Tissue Engineering Group at the University of Twente.

In his academic career he focused on the research and development of bioceramics that resemble the composition of bone. He has developed two types of bioceramic, namely bulk ceramics (dense, porous, large and small) for mechanically unloaded bone fillers, and coatings for improving the bone bonding of strong, but less biocompatible, metallic orthopedic and dental implants. His group also studied the incorporation of drugs and growth factors such as Bone Morphogenetic Proteins (BMP) into such ceramics and coatings.

Landmark publication:

Orthopaedic giants of the Netherlands

Rik Huiskes (born 18 December 1944, Eindhoven, Noord-Brabant) was Emeritus Professor Biomedical engineering at Eindhoven University of Technology TU/e.

In his academic career he focused on research and development (biomedical engineering, Eindhoven University of Technology) was appointed as Academy Professor in 2005 due to the successful development of calculation models for artificial joints, and for his new calculations of the influence of load on bone growth.

Landmark publication:

Huishkes R. If bone is the answer, then what is the question? J Anat. 2000 Aug;197 ( Pt 2):145-56. Review.

Orthopaedic giants of the Netherlands

Tom Slooff

Tom Slooff (born 3 November 1932, Eindhoven) is Emeritus Professor at the department of orthopaedic surgery at Radboud University Medical center Nijmegen, the Netherlands.

In his academic career he focused on the research and development of the bone impaction grafting technique which he started to pioneer in the late 1970’s focusing first on the acetabular reconstruction.

In 1980 he was appointed clinical professor of orthopaedic surgery. He devoted a lot of time and effort on developing and promoting the Laboratory for Experimental Orthopedics.

Landmark publication:

Guest Nation: the Netherlands @ ORS2019
ors.org/2019-guest-nation/

- the Netherlands Booth
- the Netherlands Research Presentations
- the Netherlands ORS 2019 Opening Session
- the Netherlands Podium Sessions
- the Netherlands ePosters
- the Netherlands Technique Workshop
- the Netherlands Research Interest Group: Growth Factors
Guest Nation: the Netherlands @ ORS2019
the Netherlands Booth

Stop by the guest nation booth in the exhibit and poster hall to say hello to representatives from the Netherlands Orthopaedic Association (NOV) Saturday, February 2 – Monday, February 4.
Guest Nation: the Netherlands @ ORS2019

the Netherlands Research Presentations

Join representatives from the NOV and invited Guest Nation attendees highlighting research from the Netherlands.

- Saturday, February 2
  5:45 PM – 6:15 PM
  Innovation Theater

- Monday, February 4
  5:45 PM – 6:15 PM
  Innovation Theater
Guest Nation: the Netherlands @ ORS2019

the Netherlands ORS 2019 Opening Session

Saturday, February 2
8:00 AM – 9:00 AM

The ORS Guest Nation will be recognized during the Opening Session.

Short presentation given by:

Sjoerd Bulstra, PhD
Vice President, Netherlands Orthopaedic Association (NOV)
Head of Department of Orthopedic Surgery, University Medical Center Groningen (UMCG)
the Netherlands Podium Sessions

The following papers are presented in Podium Sessions from the Guest Nation – The Netherlands. Please check the Annual Meeting mobile app for room locations.

Saturday, February 2 – Clinical Studies in Orthopaedics I
10:40 AM – 10:50 AM

Paper No. 0026
Knee Joint Distraction Compared With High Tibial Osteotomy And Total Knee Arthroplasty: Two-year Clinical, Structural, And Biomarker Outcomes. Mylène P. Jansen; Nick J. Besselink; Ronald J. van Heerwaarden; Roel J. Custers; Jan-Ton A. van der Wouden; Karen Wiegant; Sander Spruijt; Pieter Emanis; Peter M. van Roermund; Simon C. Mastbergen; Floris P. Lafeber

Sunday, February 3 – Images and Diagnostics for Infection
4:40 PM – 4:50 PM

Paper No. 0203
Real-time Arthroscopic Imaging Of Bacterial Biofilms In A Human Post-mortem Model Using Fluorescently Labelled Vancomycin. Jorrit Schoenmakers; Marjolein Heuker; Marina Lopez Alvares; Gooitzen van Dam; Jan Maarten van Dijl; Paul Jutte; Marleen van Oosten
Guest Nation: the Netherlands @ ORS2019

the Netherlands Podium Sessions

The following papers are presented in Podium Sessions from the Guest Nation – The Netherlands. Please check the Annual Meeting mobile app for room locations.

Monday, February 4
Knee – Structure and Function
10:40 AM – 10:50 AM

Paper No. 0212
In-vivo Length Changes And Isometry Of The Medial Patellofemoral Ligament During Weightbearing Motion. Willem A. Kernkamp; Cong Wang; Changzhao Li; Hu Hai; Ewoud R. van Arkel; Rob G. Nelissen; Robert LaPrade; Samuel K. van de Velde; Tsung-Yuan Tsai

Monday, February 4 – Hip – Arthroplasty
3:25 PM – 3:35 PM

Paper No. 0281
RSA Migration Analysis Of The Uncemented Trident Tritanium And The Trident HA Coated Acetabular Component: A Two Year Randomized Controlled Trial. Jacobus Arts; Timothy Vranken; Bart Kaptein; Lennard Koster; Elisabeth Jutten; Rene ten Broeke
The following papers are being presented as moderated ePosters from the Guest Nation – Netherlands in ePoster Theater located in the exhibit and poster hall.

Sunday, February 3
Exhibit Hall – ePoster Theater 1
9:30 AM – 9:33 AM

**Poster No. 653**
Involvement Of M2 Macrophages And Osteoclastogenesis In Osteoinduction By Calcium Phosphate With Submicron Topography. Huipin Yuan; Davide Barbieri; Florence de Groot; Lukas A. van Dijk; Joost de Bruijn

Sunday, February 3
Exhibit Hall – ePoster Theater 1
3:18 PM – 3:21 PM

**Poster No. 0454**
Cartilage and Synovium – Treatment and Therapeutics
Initial Structural Response Predicts Long-term Survival Of Knee Joint Distraction As A Treatment For Knee Osteoarthritis. Mylène P. Jansen; Goran S. van der Weiden; Roel J. Custers; Simon C. Mastbergen; Floris P. Lafeber
Guest Nation: the Netherlands @ ORS2019
the Netherlands Technique Workshop

Sunday, February 3
9:15 AM – 9:45 AM

HRpQCT to Study Longitudinal Bone Remodeling and Biomaterials Performance in Clinical Patients. Sponsored by: Scanco Medical AG

Speaker: Jacobus J.C. Arts, PhD

- Associate Professor Translational Biomaterials
  Department Orthopaedic Surgery
  Maastricht University Medical Centre, the Netherlands
- Associate Professor Translational Biomaterials
  Department Orthopaedic Biomechanics
  Eindhoven University of Technology TU/e, the Netherlands

High Resolution Peripheral Quantitative Computed Tomography (HRpQCT) is now more widely available and used in a variety of studies to study longitudinal changes in bone micro-architecture. The presentation will highlight the latest developments in the technology (hardware and software) as well as update on current applications and novel uses of HRpQCT. The use of Finite Element Analysis (FEA) tools to generate indices of mechanical strength data and fracture prediction will also be discussed.
Guest Nation: the Netherlands @ ORS2019

the Netherlands Research Interest Group: Growth Factors

Growth Factors: Integration of Growth Factor Input by Cells

Sunday, February 3
6:15 PM – 7:45 PM

Organizer: Peter van der Kraan, PhD, Radboud University Medical Center

The goal of the RIG is to enhance awareness and to stimulate collaboration of orthopaedic researchers working on the role and applicability of growth factors in orthopaedic diseases.

The RIG goal is to encourage intimate discussions with speakers and attendees on GFs in orthopedic research. One speaker will provide an overview, and 3-5 speakers will present exciting new data for discussion. Theme will be on the integration of growth factor input by cells.