A collection of articles written by Prof. Dr. med. M. Heinrich Seegenschmiedt (Essen, Germany) from the forum of the International Dupuytren Society (IDS). Shared in the DART Facebook group with permission of Prof. Seegenschmiedt. A gracious thanks to Prof. Seegenschmiedt for sharing his esteemed knowledge and experiences and to the IDS for their role in helping the Dupuytren and Ledderhose community.

INDEX

1. Definition of Disease Progression and Support for Decision Process

Keep a journal along with good quality photographs. Do not make yourself too nervous and avoid writing daily notes like a "diary"; it is better to summarize your findings and observations every 4 weeks for about 6 months. This is the period of time, which an experienced radiation oncologist/therapist will seek to judge on your "progression" as a starting point for the decision to initiate radiation therapy.

Moreover, you should use the following criteria to analyze your individual symptoms and physical findings:

1. **The symptom - NODULES**

   Observe and describe any change (= increase) of the number of detected nodules, any increase of size of nodules, any involvement of other finger rays than the previously involved finger ray(s), any change of the consistency of the nodules (like "soft" - "medium" - "hard").

2. **The symptom - CORDS**

   Observe and describe any development of a first cord or new cords and any increase of the length of the cord

3. **The symptom - FINGER INVOLVEMENT**

   Observe and describe the spread of new nodules and cords to the finger base or beyond into the fingers

4. **The symptom - CHANGE of HAND SURFACE PROFILE**

   Observe and describe the development of new wrinkles, folds, pit holes at the hand palm, etc.

5. **The symptom - CHANGE OF HAND and FINGER FUNCTION**

   Describe possible increased tension or pressure feeling, increase of pain, itching or other sensations; test and observe the developing of finger "bending"; test whether you are to perform the "tabletop test".

6. **SUBJECTIVE EVALUATION**

   The evaluation and changes of the above symptoms may be additionally and subjectively graded on a visual analog scale of 1 - 10.

7. **OBJECTIVE EVALUATION**

   Take photographs in defined intervals (e.g. every 3 months) under standard light conditions and mark your palpated or observed changes of the hand palm on the skin with a marker pen. Compare the photographs.

   The evaluation should be repeated about every month so that changes may be recorded for at

least 3-time intervals over a period of at least 3 months, better yet 6 months.

Patients like you should receive radiotherapy only if progression - using the above criteria - has been documented for about 6 months, as a "spontaneous standstill" of your disease progression may be possible.

8. EXAMINATION BY AN EXPERIENCED PHYSICIAN

Finally, the most important point will be the careful physical examination (palpation and function tests) of both hand palms and eventually also both foot soles by an experienced hand surgeon or radiation oncologist. Without this examination no further decision about the necessary procedures (wait and see, or radiotherapy, or minimally invasive surgery) is possible.

——— Prof. Seegenschmiedt, 2/27/2019 ———

2. Clinical Examination of Dupuytren Disease

This information and leaflet (attached to the very end of this document) is provided as a guide to all affected persons with **Dupuytren Disease** who want to perform a **Self-Examination** or will undergo a **First Appointment with a Physician** (e.g. Hand Surgeon or Radiation Oncologist).

It should help to address and document the most essential facts of the disease on both hands, namely the items:

- Nodules (number, size)
- Cords (number, length)
- Finger involvement (extension deficit or reduced angle of finger)
- Function (change)
- Pain (symptoms)
- Other signs

The possible involvement of KNUCKLE PADS should be marked on each location of the hand sketch

——— Prof. Seegenschmiedt, 3/3/2019 ———

→ see attachments 2.1, 2.2 (at the end of this document)

3. Data Form for First Assessment of Dupuytren Disease

Dupuytren - Basic Data Set - Form

This form was created about 20 years ago, then further developed and used for hundreds of patients over the past two decades.

It allows one to structure the most relevant information and data of the patient's disease record and helps to judge whether the use of radiotherapy might be a possible treatment for any early-stage disease

Stage N = disease with single or multiple nodules and/or cords WITHOUT flexion deformity
Stage N / I = disease with single or multiple nodules and/or cords WITH total extension deficit up to 10°
Stage I = disease with nodules and/or cords WITH total extension deficit up to 45°
(RT indication is limited to maximum 30° total extension deficit)

Primary disease = without any previous invasive/surgical treatment
Secondary disease = relapse/progression after previous invasive/surgical treatment(s)

Besides the completion of the data form, **high-resolution photographic documentation** of both hands/palms is essential to compare and evaluate the findings.

Additional personal notes and comments about observed clinical signs and symptoms are also very valuable basic data.

The form covers the following aspects:

- Family history
- Possible associated disorders
- Possible risk factors
- Description of possible symptoms
- Description of possible disease development
- Description of possible treatments
- Description of possible locations of nodules and cords
- Description of possible functional changes

——— Prof. Seegenschmiedt, 4/12/2019 ———
→ see attachments 3A, 3B, 3C

4. Data Form for First Assessment of Ledderhose Disease

Ledderhose - Basic Data Set - Form

This form has been created about 20 years ago and then further developed and used for hundreds of patients over the past two decades.

It allows to structure the most relevant information and data of the patient's disease record and helps to judge whether the use of radiotherapy might be a possible treatment for any stage disease, i.e.

Stage I = ONE nodule only
Stage II = multiple nodules & cords
Stage III = stage II plus skin OR muscle involvement
Stage IV = stage II plus skin AND muscle involvement (ultrasound or MR imaging)

Primary disease = without any previous invasive / surgical treatment
Secondary disease = relapse / progression after previous invasive / surgical treatment(s)

Besides the completion of the data of this form **high-resolution photographic documentation** of both foot soles is essential to compare and evaluate the findings.

Additional personal notes and comments about observed clinical signs and symptoms are also very valuable basic data.

The form covers the following aspects:

- Family history
- Possible associated disorders
- Possible risk factors
- Description of possible symptoms
- Description of possible disease development
- Description of possible treatments
- Description of possible locations of nodules & cords
- Description of possible functional changes (gait disorder etc.)

——— Prof. Seegenschmiedt, 9/11/2019 ———
→ see attachments 4A, 4B and 3C

5. Data Form for Follow-Up Assessment of Dupuytren Disease

The attached **Follow-Up Form for Assessment of Dupuytren/Ledderhose Disease** allows a regular communication and exchange of relevant clinical data between the patient and the radiation oncologist/therapist on a well-defined basis after completion of the radiation treatment. It addresses the following six items of Dupuytren/Ledderhose Disease:

1. Development of skin retraction
2. Nodules (change of size and number)
3. Cords (change of length and number)
4. Stretching loss (angle of extension deficit)
5. Pain & other atypical signs and symptoms
6. Daily function(s) related to hands (e.g. tabletop test)
   and feet (e.g. gait, walking barefoot on uneven surfaces, etc.)

Moreover, the possible **changes in the consistency** of specific "key" nodules or cords may be classified into 4 groups and compared with the consistency of everyday objects like

normal consistency --> 1) tomato --> 2) orange --> 3) tennis ball --> 4) golf ball/coconut

It is also advisable to perform **specific exercises/function tests** to compare the "daily activities" or "special functions".

Moreover, additional **standard photographs** of the affected extremities at defined time intervals, e.g. pre-treatment/post-treatment at 3/6/12/24/36 and 60 months post-treatment, may help to discover and compare different changes on a more objective way than rather any "free guessing".

In some instances, it is useful to use a **Numeric Rating Scale** ranging from "0" (zero) to "10" (10) to follow the change of specific symptoms like pain, itching, pressure or tension feelings.

Finally, specific "**patient-related outcome measures (PROMs)**" are available as questionnaires or as specific scores & evaluation tools, such as the **DASH Score** (with 30 questions/items) or the **Quick-DASH Score** (with 11 questions/items).

The After-Care Assessment of a patient should be performed on a regular basis **after any therapeutic intervention** (injections, minimally invasive and open surgical procedures or radiotherapy) for example at 3 months, 6 months, 1 year and thereafter annually up to 5 years.

The documentation can be made just for **personal use** or in the context of an **agreed exchange** with a therapeutic center (surgery or radiotherapy) for long-term evaluation in clinical studies.

Photographic documentation is nowadays easy (e.g. by using smartphones) and should be regularly performed under standardized light conditions at similar time intervals as mentioned above for both hand palms and foot soles and special photos, if other sites are involved, e.g. knuckle pads or do document specific functional deficits, etc.
——— Prof. Seegenschmiedt, 10/4/2019 ———
→ see attachments 5A, 5B

6. Patient Related Outcome Measures (PROMs) - Quick-DASH

PROMs are useful tools to evaluate the result of a specific treatment over a longer time which is usually called "Follow-Up" and applied at defined time intervals, e.g. pre-treatment/post-treatment at 3/6/12/24/36 and 60 months post-treatment. Herein I present the DASH Score which can be found at the following links:

http://orthotoolkit.com/dash/ (DASH Score - **30 Questions / Items**)
http://orthotoolkit.com/wp-content/uploads/2018/02/DASH.pdf

http://orthotoolkit.com/quickdash/ (Quick DASH Score - **11 Questions / Items**)
http://www.orthopaedicscore.com/scorepag..._quickdash.html

The questionnaire asks about the **patient's symptoms** and the ability to **perform certain activities**.

Every question needs to be answered based on the patient's condition in the last week.
If the patient did not have the opportunity to perform a specific activity in the past week,
the best estimate should be made on which response would be the most accurate.

It doesn't matter which hand or arm is used to perform the specific activity;
the answer should be based on the patient's ability regardless of how the task is performed.

Please rate your ability to do the following ACTIVITIES in the last week

1. Open a tight or new jar
   No difficulty --> Mild difficulty --> Moderate --> Severe difficulty --> Unable to perform task
2. Do heavy household chores (eg wash walls, wash floors)

No difficulty --> Mild difficulty --> Moderate --> Severe difficulty --> Unable to perform task

3. Carry a shopping bag or briefcase
   No difficulty --> Mild difficulty --> Moderate --> Severe difficulty --> Unable to perform task
4. Wash your back
   No difficulty --> Mild difficulty --> Moderate --> Severe difficulty --> Unable to perform task
5. Use a knife to cut food
   No difficulty --> Mild difficulty --> Moderate --> Severe difficulty --> Unable to perform task
6. Recreational activities in which you take some force or impact through your arm, shoulder or hand (golf, hammering, tennis, etc.)
   No difficulty --> Mild difficulty --> Moderate --> Severe difficulty --> Unable to perform task
7. During the past week, to what extent has your arm, shoulder or hand problem interfered with your normal social activities with family, friends, neighbors or groups?
   Not at all --> Slightly --> Moderately --> Quite a bit --> Extremely
8. During the past week, were you limited in your work or other regular daily activities as a result of your arm, shoulder or hand problem?
   Not limited at all --> Slightly limited --> Moderately limited --> Very limited --> Unable

Please rate the severity of the following SYMPTOMS in the last week

9. Arm, shoulder or hand pain
   None --> Mild --> Moderate --> Severe --> Extreme
10. Tingling (pins and needles) in your arm, shoulder or hand
    None --> Mild --> Moderate --> Severe --> Extreme
11. During the past week, how much difficulty did you have sleeping because of the pain in your arm, shoulder or hand?
    No difficulty --> Mild difficulty --> Moderate --> Severe difficulty --> I can't sleep

There are two further small sections to this score which are both optional:
the **WORK MODULE** (4 questions) and **SPORTS / PERFORMING ARTS MODULE** (4 questions)

Reference for score: Hudak PL et al. Am J Ind Med. 1996 or : http://www.dash.iwh.on.ca/
——— Prof. Seegenschmiedt, 5/18/2019 ———

7. Dupuytren's -- How early is too early?

Sufficient Time Required to Define Progression and Initiate Treatment
or **"Finding the Moment of Kairos"**

It is important to recognize that Dupuytren Disease (DD) is a symptom complex that may compromise hand function and eventually quality of life but does not appear to affect survival. Thus, there is no *"emergency decision"* but always a *"careful shared decision making"* between the affected person and the treating and fully knowledgeable medical specialist required.

Given this context in pursuing a **treatment plan**, the clinical specialist should carefully weigh the potential benefit to the individual person of a particular treatment against that potential treatment's risk for

adverse events, the severity of those adverse events, and the reversibility of any occurring adverse events.

For some individuals, **thoughtful counseling** regarding the nature of DD and the typical disease course may be sufficient to alleviate concerns, and a patient may choose **not to pursue further treatment**.

After a **careful education** on normal hand function and possible exclusion of other diseases which may be the reason for any observed symptoms (e.g. pain, itching, tingling sensations, etc.) **sufficient time** is required to affirm the potential disease-related symptoms. Moreover, a minimum period of 3 - 6 months is usually required to observe and define such *"progressive symptoms"* for Dupuytren Disease.

The risks and benefits of the various treatment alternatives including a **"wait and see strategy"**, and the common agreement on **realistic treatment goals** (if the individual desires treatment and is willing to engage in treatment), then a shared decision regarding the treatment plan can be conducted.

At the present time, there is no agreed-upon **minimum symptom complex** necessary prior to any intervention in DD which includes radiotherapy. Nevertheless, it should not be recommended to irradiate the hand of an individual without even palpating a single nodule and not following the progression of that nodule for a minimum period of 3 - 6 months.

Thus, I would strongly recommend **NOT TO TREAT** without clear documentation of progression of the observed objective findings. One should always keep in mind, that there is not only a "TOO LATE SITUATION" for the use of radiotherapy but also a "TOO EARLY SITUATION" for any intervention in DD including the option of prophylactic radiotherapy.

This requires the art of living with an appropriate mixture of **KAIROS** (*"finding the right moment"*) and **CHRONOS** ("acting according to a strictly defined timeline") - time will be always an individual concept in DD and requires a careful and meaningful shared decision-making process and sufficient patience and dialogue between the affected individual and the physician.

In Summary:
I would NOT IRRADIATE the hand palm(s) of an individual with only symptoms like itching, tingling or pain symptoms and would start to carefully monitor the individual hand by inspection and palpation (and eventually diagnostic tools) for any new sign of DD (including wrinkling, nodules, cords etc.). In addition, I would not treat an individual with just a single nodule which has not shown a "progressive disease pattern" (increase in size, number, and consistency) over a defined time period --> see separate threads.
——— Prof. Seegenschmiedt, 6/1/2019 ———

8. To treat or not to treat – that is the question

Sufficient Time Required to Define Progression and Initiate Treatment
or **"Finding the Moment of Kairos"**

It is important to recognize that Dupuytren Disease (DD) is a **symptom complex** that may involve different types of clinical signs and symptoms such as.

1. **Invisible signs or symptoms**
   like "itching, tingling, pain symptoms, etc."

2. **Visible signs like nodules and cords**
   Including "wrinkling, puckered or dimpled skin, U-shaped compression zones in the hand palm, contractions in the interdigital spaces, which distort from primarily U-shaped web spaces into a V shape

3. **Palpatory signs**
   like "round-shaped nodules (knots) or longitudinal shaped cords and their relative consistency (soft to hard)"

4. **Functional signs**
   like "limited finger bending or extension, compromised finger and thumb spreading, failure of tabletop test, etc."

All these symptoms may result eventually in **functional changes** (profession, leisure, and daily activities) and **disabilities** (deterioration of normal functions) and overall **changes of the Quality of Life** (including various psychosocial dimensions of DD, e.g. avoidance of hand-to-hand contact and other usual hand activities).

Nevertheless, Dupuytren and Ledderhose Disease both do not appear to affect the survival of the affected individual.

Thus, there is no *"emergency decision"* but always a *"careful shared decision making"* between the affected person and the treating and fully knowledgeable medical specialist required.

When it is meaningful TO START treatment?

Given this context in pursuing a **treatment plan**, the involved clinical specialist (radiation oncologist/therapist, hand surgeon) should always carefully weigh the potential benefit of a particular treatment to the individual person against that potential treatment's risk for adverse events, the severity of those adverse events, and the reversibility of any occurring adverse events.

For some individuals, **thoughtful counseling** regarding the nature of DD and the typical disease course may be sufficient to alleviate concerns, and the counseled individual may choose **not to pursue further treatment**.

After a **careful education** on normal hand (or foot) function and possible exclusion of other diseases which may be the reason for any observed symptoms (e.g. pain, itching, tingling sensations, etc.) **sufficient time** is required to affirm the potential disease-related symptoms.

Moreover, a minimum period of 3 - 6 months is usually required to observe, document and finally define such *"progressive symptoms"* for Dupuytren Disease. A specific time protocol with 4-week intervals for regular reporting and documentation of symptoms appears to be a useful instrument ("diaries" should only include "new symptoms" or "special observations").

The risks and benefits of the various treatment alternatives including a **"wait and see strategy"**, and the common agreement on **realistic treatment goals** (if the affected individual desires treatment and is willing to engage in treatment), then a **shared decision-making process** regarding the specific treatment plan can be conducted.

At the present time, there is no agreed-upon **minimum symptom complex** necessary prior to any

intervention in DD which includes radiotherapy. Nevertheless, it should not be recommended to irradiate the hand (or foot) of an affected individual without even palpating a single nodule and not following the progression of that nodule for a minimum period of 3 - 6 months.

Thus, I would always strongly recommend **NOT TO TREAT** without a comprehensive documentation of the disease progression of the observed subjective symptoms (measured on VAS = visual analogue scales or NRS = Numeric Rating scales (0 to 10) or the objective findings (number, size, consistency of nodules and cords, etc.) and the measured functional changes (individual finger angulation, finger spreading, function tests like "tabletop" etc.) .

One should always keep in mind, that there is not only a "TOO LATE SITUATION" for the use of radiotherapy but also a "TOO EARLY SITUATION" for any intervention in DD including the option of prophylactic radiotherapy.

This requires the art of living with an appropriate mixture of **KAIROS** (*"finding the right moment"*) and **CHRONOS** ("acting according to a strictly defined timeline") - time will be always an individual concept in DD and requires a careful and meaningful shared decision-making process and sufficient patience and dialogue between the affected individual and the physician.
——— Prof. Seegenschmiedt, 6/1/2019 ———

9. Will RT help me? One doctor said no, another said yes

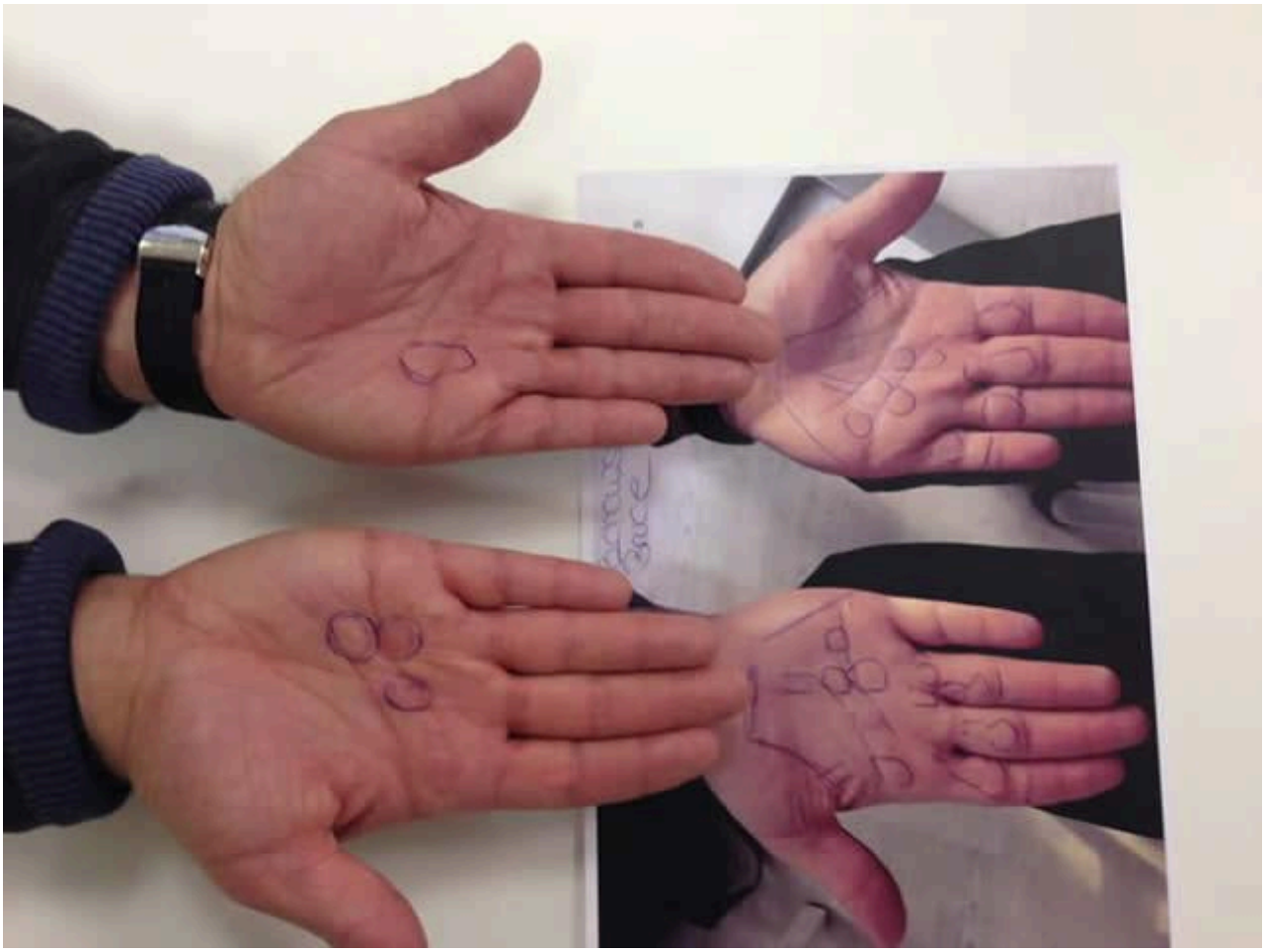
To give you meaningful and valuable advice, one has to see and eventually **inspect your hand palms** including the fingers on photographs with high resolution; however, that is only one side of the coin! On the other side, you need an experienced physician who has long-term experience in **palpating those affected hands and fingers** to detect nodules and cords which might not be visible on the surface of your hand palms. A good example of the patient's perspective and the physician's findings is shown below

In addition, the **individual hand function** has to be examined, including the spreading ability of your fingers and the actual ability to stretch your fingers (not with pushing them on the table by means of your body weight or by the other hand ...).

All in all, radiation therapy may be too late for you if the flexion deformity of one of your digits has already reached an angulation of 30° or more.

With regard to the proposed radiation dose concepts, it's not very scientific or prudent to irradiate only with ONE COURSE of radiotherapy. To which total dose shall the radiation therapy be prescribed - five or ten treatments?

Long-term follow-up is an essential key point both for the patient and the doctor, as only these constant recalls make the physician more aware of the appropriately chosen treatment and the possible successes and failures and it makes the patient more conscious about the fact that the doctor is actually interested in the long-term outcome and knows the own results.
——— Prof. Seegenschmiedt, 7/26/2019 ———.



10. The stage of your disease status normally determines your best options

Personal Risk Assessment:

1. Any family members affected (father, mother, siblings, etc.)
2. Heavy mechanical work with your hands
3. Any trauma to the upper extremities (fracture, injury, operations)
4. Any of the following diseases: thyroid disease, diabetes mellitus, liver disease, perfusion related disorders (Raynaud's), any form of collagenosis
5. Any of the following risk factors: additional Ledderhose Disease, keloid formation, Peyronie's Disease

Personal Stage Assessment:

1. Nodule formation -- number, size and speed of development (months, years ...) and distribution

2. Cord formation -- number, size, speed of development (months, years ...) and distribution
3. Functional changes -- special functional deficiencies? Tabletop test possible? Any extension deficit in one of your finger "rays".
4. Symptoms -- itching, pressure or tension, tightness, pain, etc.
5. Other observations

Speed of Disease Development:

Changes within a period of time (how many weeks or months?)

1. Continuous progression, or
2. Progression with intermittent "periods of quietness"

Steps of Decision-Making Process:

1. No Treatment - No influence on progression - means waiting until the period of surgical or invasive procedures starts. You may use "massage" therapy or other types of unproven methods for prevention of progression. No long-term studies are available. You may try for a while and compare outcomes on a regular basis (e.g. for 3 months).

2. Radiation therapy is only effective in the **early and progressive stage of the disease** (formation of nodules, first cords, no or minimal functional deficit; clearly documented progression within 3 - 6 months). Radiation therapy should not be applied in a quiescent situation and not in more advanced stages (e.g. functional deficit >= 10 - 30 degrees). For this indication, large clinical studies with long-term follow-up (over 5 years) have already found a chance of about 90% prevention of further disease progression when using RT.

If radiation therapy is applied in the more advanced ("fibrotic") stages of the disease, the effect of ionizing radiation is inefficient. Radiation therapy addresses the basic mechanism and target cells of the disease, the "inflammatory cells" and proliferating fibroblast pcell population, and leads to a stop of the progression, in some instances even to a regression of the nodules and clinical symptoms. Dry skin may be a late effect; no functional changes on hand and finger function; the chances of inducing "fibrosis" is minimal with 2 radiotherapy series and a total of 30 Gray (the 5% probability to develop fibrosis within 5 years requires a dose of about 60 Gray!). In your age bracket, the potential risk to induce a cancer in the treated area can be estimated below 1% within the next 30 years.

3. Invasive procedures like percutaneous needle fasciotomy (PNF) or needle aponeurotomy (NA), collagenase injection (CI) or open surgical procedures (partial or total fasciectomy or dermatofasciectomy) are not in "therapeutic competition" with radiation therapy as these methods are intended for more advanced stages (> 30 degrees), for which radiation therapy is NO SOLUTION. The invasive measures only correct a formerly disabled finger joint, which may develop over a few months or several years. Dr. Charles Eaton refers to these disease stages when calling "no effect" of radiotherapy, and he is right with this statement.

(Note: this post by Prof. S. is a response to a question posed by a musician). As a musician, you may not want to wait for a stage in which you may not be able to perform your art and early intervention and stop of the basic disease mechanism appears to be a quite logical answer.

In my own practice over the past 3 decades, several musicians (playing piano, guitar, flute, violin, etc.) had long-term benefit from using radiation therapy applied with 2 series of each 5 x 3 Gray with a break of 12 weeks in between. Careful examination by a well-experienced physician and long-term follow-up

are important criteria for the selection process.
——— Prof. Seegenschmiedt, 12/14/2018 ———

11. What is considered a rapid progression of the disease?

From the perspective of radiation therapy "rapid progression" is considered when the following changes of symptoms/signs occur and progress within a period of 3 - 6 months:

1. **Nodules:**
   Change (= increase) of number of detected nodules; increase of the size of nodules; involvement of other finger rays than the previously involved finger ray; change of the consistency of the nodules (soft - medium - hard)

2. **Cords:**

   Development of a first cord or new cords; increase of the length of the cord

3. **Finger Involvement:**
   Spread of new nodules and cords to the fingers

4. **Change of Hand Surface Profile:**
   Development of new wrinkles, folds, pit holes, etc.

5. **Change of Hand and Finger Function:**
   Increased tension or pressure feeling; increase of pain; itching or other sensations; developing of finger "bending"; unable to perform the tabletop test.

6. **Subjective Evaluation:**
   Evaluation and changes of the above symptoms may be additionally and subjectively graded on a **scale of 1 - 10**.

7. **Objective Evaluation:**
   Take photographs in defined intervals (e.g. every 3 months) under standard light conditions and mark your palpated or observed changes of the hand palm on the skin with a marker pen. Compare the photographs.

The evaluation should be repeated about every month so that changes may be recorded for about 3-time intervals over a period of at least 3 months. Six months is even better.

Patients should receive radiotherapy only if progression - using the above criteria - has been documented for at least 3 months; I personally prefer even an observation period of 6 months, as a "spontaneous standstill" may be possible.
——— Prof. Seegenschmiedt, 11/23/2018 ———

12. What is the Appropriate Size of Radiation Field (Portal)?

Radiation therapy fields (also named portals) are usually constructed from the physical findings after careful palpation of the hand palm; thus, the marked nodules and cords in relation to the affected finger

rays plus a safety margin of 1 cm lateral and about 2 cm longitudinal determine the individual RT field. I provide an example from the Groningen book, how far my own findings and physician´s findings may differ (picture attached)

In the example shown the RT field appears rather small and too long on the area of the wrist, as there are rarely nodules to be found in that region.

I agree with the other comments: there is no published case of secondary malignancy induced by radiation therapy, but up to 20% overall short and long-term complications and side-effects from surgery. Our informed consent for a patient around 50 years usually includes a statement about the possibility to develop cancer within the irradiated area of less than 1% within the next 30 years. I have never observed one case in more than 1,000 patients treated so far.

Careful skincare during and after radiation therapy is important. I usually recommend Excipial Lipo Lotion with 4% Urea which is often used by patients with irritated skin suffering from neurodermatitis.
https://www.excipial.de/produkte/urea/u-lipolotio/
——— Prof. Seegenschmiedt, 2/24/2019 ———

13. Is There an Optimal Time Interval between the two RT series?

The actually most applied actual RT schedule consists of two RT courses of each 5 x 3 Gy (= 15 Gy) up to 30 Gy total dose

However, what is the best timing of the two RT series?

Unfortunately, so far there is no sufficient or conclusive answer available, as so far only ONE CLINICAL RT STUDY has ever explored the effects of the time interval together with the use of two different RT total doses under controlled clinical study conditions within a randomized clinical trial (*):
https://www.ncbi.nlm.nih.gov/pubmed/11172962

https://www.researchgate.net/publication...llierten_Studie

From this study, however, it can be concluded, that a RT-schedule of 7 x 3 Gy (with a total dose of 21 Gy) applied within a period of 2 weeks has caused MORE ACUTE RADIOGENIC SIDE EFFECTS than a RT-schedule using a higher total RT dose of 30Gy (10 x 3 Gy), but split up into two separate RT series of each 5 x 3 Gy (= 15 Gy) separated by 6 - 8 weeks.

WHAT ARE REASONS TO USE 12 WEEKS BETWEEN TWO RT SERIES?

In my long-time radiotherapy practice over almost 30 years I initially started with a 6 weeks interval between the first RT SERIES (5 x 3 Gy up to 15 Gy) and the second RT SERIES (5 x 3 Gy up to 30 Gy) for a total of TWO RT SERIES.

However, I have abandoned this RT scheme since more than 10 years for the following reasons:

(1) BETTER EVALUATION of ACUTE RADIATION REACTIONS:

They have usually not faded away including treatment induced possible itching, new "pain" symptoms, burning sensations, tension or pressure feelings, evtl. some remaining swelling and other symptoms etc.

> This may eventually prevent the start for the pre scheduled 2nd RT-SERIES causing additional organizational problems.

(2) BETTER TIME-POINT FOR EVALUATION OF SIDE EFFECTS:

After an interval of 12 WEEKS or about 3 months after the 1st or 2nd-RT-SERIES the definition for the radiation induced reactions changes by definition from the "acute radiation effects" (day 1 - 90 post applied radiotherapy) to "chronic radiation reactions" (day 91 and longer).

> CONSEQUENCE: Acute radiation side effects can be better summarized after 90 days than after shorter time intervals.

(3) BETTER TIME POINT FOR EVALUATION OF RESULTS:

12 weeks or 3 months after RT is usually a much better time point to study and EVALUATE FIRST RESULTS like changes in nodule and cord number(s), size(s) and consistencies. After such a time period there are often first hints available to foresee how the reaction to radiotherapy has affected the skin and subcutaneous tissues (e.g. affecting moisture and elasticity) and the special hand and finger functions (e.g. increased stiffness or better spreading of fingers?).

> RECOMMENDATION: Always use a pre-defined scheme for evaluation, e.g. AFTER CARE EVALUATION FORM (attached)

(4) RADIOBIOLOGICAL REASONS

Dupuytren & Ledderhose Disease is - unlikely to malignant tumors - not composed and driven by fast proliferating cells. Thus, rapid performance of ALL TREATMENT in 1 SERIES is not useful, as some of the proliferating cells have not yet reached the radio-sensitive phase of cell division called MITOSIS.

> Thus, a longer time interval of 12 weeks may be more useful and favorable, as more proliferating fibroblast cells could have reached this more radio-sensitive mitotic stage than after a much shorter interval of only 6 weeks or even shorter.

OVERALL CONCLUSION:

Delaying the 2nd RT SERIES up to 12 weeks is practiced by myself now for almost 20 years in clinical studies with very good experience on several hundreds or over 1,000 patients with good outcome.

The same time interval is recommended for the EVALUATION after the 2nd RT-SERIES (after 30Gy) including the 3-months POST-TREATMENT EVALUATION.

The following after care intervals should also include a 6-MONTHS and 12-MONTHS = 1-YEAR-Evaluation and thereafter EVERY YEAR up to 5 YEARS using a standardized evaluation program:
——— Prof. Seegenschmiedt, 10/18/2019 ———
→ see attachments 5A, 5B

14. MSK imaging by MSK radiologist

MSK stands for **ultrasound imaging of musculoskeletal disorders** which may include Dupuytren Disease. There are a few recent publications available that describe the typical features and capabilities of this imaging method which allows visualizing **distinct findings in the hand palm** related to Dupuytren Disease. It also helps to distinguish other possible causes of sometimes painful nodules and cords, e.g. ganglion cysts or inflammatory tendonitis or a painful neuroma.

However, it is very doubtful, that ultrasound imaging will detect "Dupuytren Disease" earlier than any palpatory finding, either by the patient himself/herself or an experienced physician, which would mean that we would have a screening tool available for so far undetectable cases.

Ultrasound examinations can only detect and define certain criteria of **existing tissue alterations,** such as.

- specific location and depth of the lesions in relation to joints (e.g. MC and MCP joints)
- specific lesion dimensions (in millimeter; follow-up comparison)
- characteristic echo-quality (typically most are "hypoechoic")
- characteristic reaction to compression (typically most are "non-compressible")
- a few (mostly older) lesions may contain calcifications
- eventually increased blood supply ("hyperemia") can be detected by Color Doppler Ultrasound

A recent study on the use of ultrasound imaging for early detection was published by Morris et al (2019)

Link: https://onlinelibrary.wiley.com/doi/abs/10.1002/jum.14699

Abstract: https://www.ncbi.nlm.nih.gov/pubmed/30027660
——— Prof. Seegenschmiedt, 4/28/2019 ———

15. Radiotherapy Questions and Answers

Radiation therapy is usually applied with **orthovoltage machines** (with 100 - 120 kV X-rays) or **linear accelerators** (with 4 - 6 MeV electrons). On both radiation machines, the intention is to provide sufficient dose to the palmar side of the hand and avoid dose to the dorsal side of the hand.

With this in mind, a recent publication from Dr. Ruby Meredith et al. regarding dose optimization is important. They show that the application of sufficient bolus material (5 - 10mm) is important to place on the treatment area to adapt the dose depth profile. The enclosed figure demonstrates the dose distribution within the hand in a cross-section view:

Figure 1: Dupuytren_RT_3D-Planning

The different depth dose profiles of electrons (6 MeV and 18 MeV) and photons (6 MV) are demonstrated in the other figure.

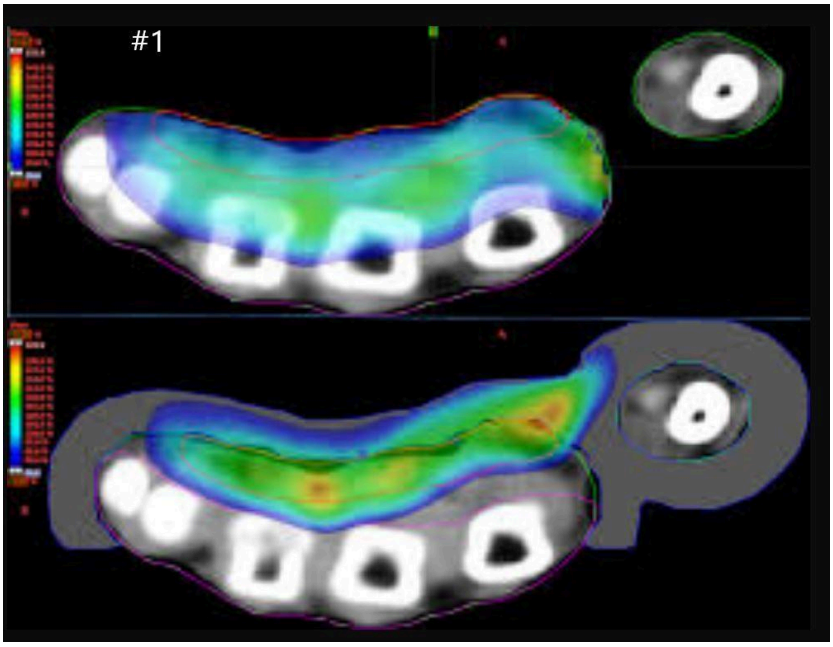
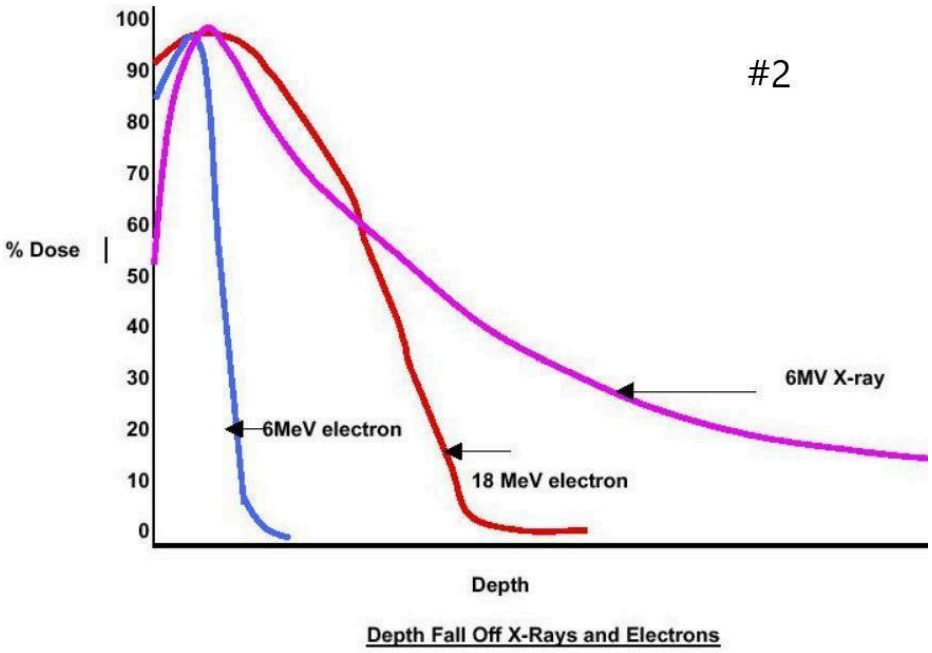


Figure 2: Radiation-Dose-Depth-Profile of Electrons-and-Photons



The link to the publication is: http://nobleresearch.org/Content/PDF/5/2...8511.2017-1.pdf
Meredith R et al., J Clin Radiat Oncol. 2017, 2(1):1-3 / http://dx.doi.org/10.14312/2397-8511.2017-1
Title of Publication: Dosimetric comparison of radiation methods for palmar fibrosis
——— Prof. Seegenschmiedt, 3/24/2019 ———

16. Missed Radiotherapy Session

Do not worry about a "Missed Radiotherapy Session". This happens all over the world and rarely affects the treatment outcome of patients as long as they will receive the full prescribed dose of 2 RT series of each 15 Gy up to a total of 30Gy.

The effects of radiotherapy on **active fibroblasts,** which are the driving force of disease progression in Dupuytren and Ledderhose Disease, are independent of a precise timetable. For practical reasons, the dose is usually split up over a longer period of time of about 3 months. The most applied treatment concept is that of 10 x 3Gy in two RT-series of each 5 x 3Gy up to 15Gy per RT-series within 12 weeks. However, in former times other RT-concepts with 2 x 4Gy every 4 weeks up to a total dose of 32 Gy were also successfully applied. In contrast, RT-concepts with 10 x 2Gy were less successful.

It appears that not all "active fibroblasts" are equally sensitive to ionizing radiation every day; those which are most sensitive are fibroblasts undergoing the mitosis phase when they divide and become two cells; the least sensitive fibroblasts are those in the "dormant stage". For that reason, the radiation dose is spread out over a longer period of time.

In summary, there is no problem to receive one fraction of the planned RT doses delayed by 72 hours!
——— Prof. Seegenschmiedt, 3/8/2019 ———

17. Typical Reactions After Radiotherapy for Dupuytren Disease

Radiotherapy for nodules, cords and pathologic changes on the palmar fascia in Dupuytren Disease induces and affects the skin, subcutaneous tissue and down to the palmar fascia. Following radiotherapy typical symptoms may occur in the irradiated area including some itching, hypersensitivity of the skin, tingling and burning sensations and rarely even some pain symptoms. On the skin in the treated area, some reddening (called erythema) can occur; eventually, the irradiated subcutaneous tissue may develop some puffiness and swelling. The possible affected tissues in relation to the hand anatomy are shown in **Figure 1.**

The typical zones of the radiation exposed areas of the hand palms (called radiation portal) are demonstrated in **Figure 2.**

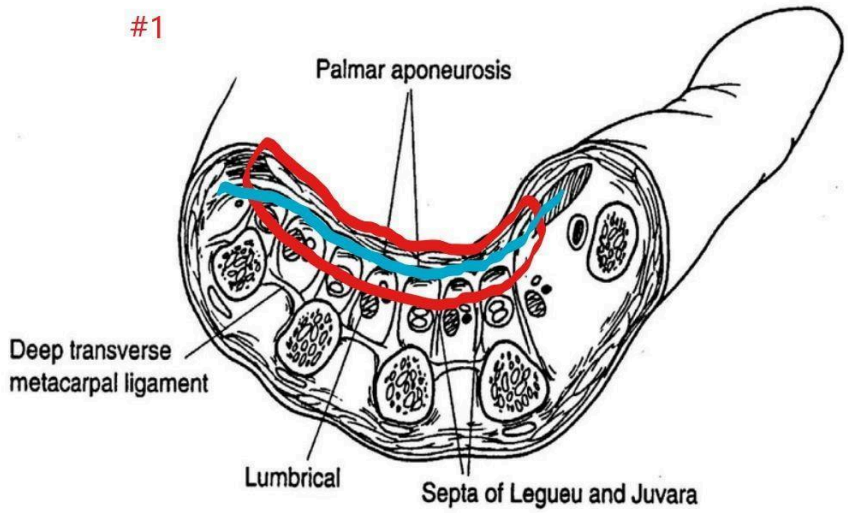
The possible radiogenic side-effects are classified in 4 grades (according to the RTOG = Radiation Therapy Oncology Group or other groups). See **Figure 3.**

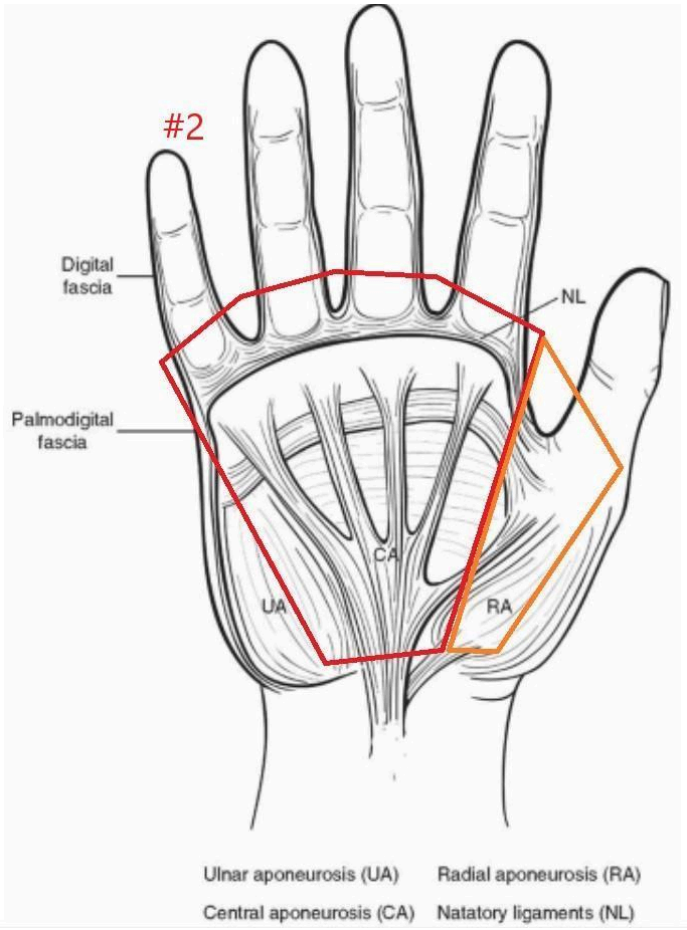
Usually, after one course of radiotherapy with 5 x 3Gy up to a total of 15 Gy, the grade 1 side effects occur in about 25 - 50% patients depending upon their individual risks (genetic disposition, additional diseases like diabetes mellitus, nicotine abuse, etc.). Additional chemical, physical (heat, cold) and mechanical stress (heavy mechanical work) at the irradiated areas should be avoided during and about 2 - 4 weeks after radiotherapy. We usually recommend Excipial Lipo lotion with 4% Urea for regular skin care during and after radiation therapy.

After the 1st RT series of 15 Gy, the nodules and cords may not change or may to progress and not come to a stand-still; sometimes the nodules even seem to be "activated" with different observations like

"swelling" and "hardening" which are not poor indicators for the later treatment outcome. Those individuals should be patient and await the 2nd RT series.

The best time points in follow-up to summarize the therapeutic effects on the disease and possible radiogenic side-effects are 3 months and 1 year after radiotherapy.
——— Prof. Seegenschmiedt, 3/24/2019 ———





#3	Grade 1	Grade 2	Grade 3	Grade 4
Acute radiation dermatitis RTOG/EORTC				
Acute effects	Follicular, faint or dull erythema, epilation, dry desquamation, decreased sweating	Tender or bright erythema, patchy moist desquamation, moderate edema	Confluent, moist desquamation other than skin folds, pitting edema	Ulceration, hemorrhage, necrosis
Chronic radiation dermatitis RTOG/EORTC				
Skin	Slight atrophy, pigmentation change, some hair loss	Patchy atrophy, moderate telangiectasia, total hair loss	Marked atrophy, gross telangiectasia	Ulceration
Subcutaneous tissue	Slight induration (fibrosis) and loss of subcutaneous fat	Moderate fibrosis, but asymptomatic; slight field contracture, ≥10% linear reduction	Severe induration and loss of subcutaneous tissue, field contracture, ≥10% linear reduction	Necrosis
LENT/SOMA				
Subjective Pain	Occasional and minimal hypersensation, pruritus	Intermittent and tolerable	Persistent and intense	Refractory and excruciating
Objective Telangiectasia Fibrosis Ulcer	<1 cm^2 Barely palpable, increased density Epidermal only, <1 cm^2	1-4 cm^2 Definite increased intensity and firmness Dermal only, >1 cm^2	>4 cm^2 Very marked density, retraction and fixation Subcutaneous	Bone exposed, necrosis

RTOG: Radiation therapy oncology group, EORTC: European organization for research and treatment of cancer LENT: Late effects normal tissue, SOMA: Subjective, objective, management, and analytic

18. Dupuytren/Ledderhose Disease – After-Care following Radiation Therapy

Avoid Three Major Stress Factors for Hands / Feet for about 4 weeks

1. No extreme mechanical stress (carrying/lifting heavy weights etc.)
2. No physical stress (e.g. extreme heat, cold exposure)
3. No chemical stress (e.g. alcohol, chemicals, irritating liquids)

Use Ointments Daily in Case of Dry Skin (especially before sleeping)

1. To moisturize the skin
2. To bring back fat and grease
3. To keep the elasticity of the skin
4. We recommend: Excipial Lipo lotion 4% Urea 200ml (Fa. Spirig, Switzerland)

Test your Performance with Mechanical Exercises

1. Spread your fingers (test your finger span)
2. Extend your hands and fingers (lean against the wall)
3. Test your hand and fingers with table-top test

Follow Your Changes with a Written Protocol

1. Examine your hands and feet regularly
2. Count number of nodules and cords
3. Describe and document possible changes
4. Repeat every 3 months for 1 year after RT, then every year

Photographic documentation on a regular basis is advised. e.g. every 3 months after the radiation treatment for the first year or at the time a significant change can be observed.

Don't hesitate to contact us with a photocopy of your hand and marked changes.

We wish you the best success. Your team at the Radiotherapy Practice in Essen
Radiologie am Stern, Bertoldstrasse 1-3, 45130 Essen (Germany) Prof. Dr. med. M.Heinrich Seegenschmiedt; Dr. med. Sedat Yilmam, email: praxis@radiologie-am-stern.de / radiologie.am.stern@gmail.com

——— Prof. Seegenschmiedt, 3/2/2019 ———
→ see attachments

19. Best Advice for Hand Care after Completing Radiation Therapy

The question is well justified and not routinely addressed from all doctors when finishing your radiation treatment after the 1st and even more after the 2nd course of radiotherapy; also long-term aspects are not routinely considered.

It is important to reflect on the following aspects:

(1) WHAT TYPE OF SKIN DO YOU GENERALLY HAVE AS WELL AS YOUR PALM

(a) NORMAL SKIN = has a smooth texture and a rosy, clear surface, and fine pores. There are no visible blemishes, greasy patches or flaky areas. Sebum production, moisture content, keratinization, and desquamation are well-balanced. Usually found in young persons.

(b) OILY SKIN = Skin with an increased amount of lipids on the skin surface due to overactive sebaceous glands, often shiny, thick and with large pores. The skin is prone to blackheads and other blemishes. Usually more often in males than females and during adolescence and younger age.

(c) DRY SKIN = lack of moisture in its corneous layer causing tight and even flaking skin. Skin can appear dull, especially in the face on cheeks and around the eyes. It can have reduced elasticity but accentuated fine lines and wrinkles. In severe cases often itching and burning sensations can occur. Very dry skin shows signs of cracking and fissuring.

(d) COMBINED TYPE = Rather dry skin in some body sites and oily in other sites. Mixed facial skin with some dryness on the cheeks and around the eyes while typically exposing oilier in the facial T - zone (nose, forehead, chin); thus, usually different skincare is required. Dry sites and oily require different skincare regimens.

However, radiation therapy will affect the sebaceous glands and shrink down their production of gland secret, thereby affecting the sweat production; more or less dry skin can be the result depending on the basic skin type before starting RT treatment.

(2) UNDERLYING DISEASES CAN MAKE SKIN PRONE TO RADIOGENIC SIDE-EFFECTS

(a) Local ECZEMA, DYSHIDROSIS, PSORIASIS, ROSACEA and many other SKIN DISORDERS of the extremities
(b) diabetes mellitus, peripheral neuropathy (PNP) of various origins
(c) hormonal changes (menopause, thyroid disorders, etc.)
(d) genetic predisposition of the individual (e.g. ATA-gene)
(e) special oral or other medications (chemotherapy, antibodies)
(f) special diets (lack of antioxidants and omega-3 fatty acids)
(g) special climate and weather conditions
(h) unfavorable skincare routine (e.g. over-exfoliating, over-moisturizing, or using irritating/drying ingredients)
(i) extensive sun exposure (a major cause of hyper-pigmentation) and
(h) special pollution (which can create free radical activity that damages collagen production)

(3) SPECIAL PROFESSIONAL OR LEISURE ACTIVITIES

(a) heavy skin strain with large machines handling (jackhammer etc.)
handling of very hot objects or chemical irritating substances
(b) special sports activities, like rock climbers, tennis sport, martial arts with heavy physical strain on your hand palm;

CONCLUSION:

THESES ASPECTS HAVE TO BE EXPLORED AND DOCUMENTED BEFORE USING LOCAL TREATMENTS including external beam radiotherapy etc.

ADVICE FOR PATIENTS AFTER RT ARE ATTACHED HERE → see attachments
——— Prof. Seegenschmiedt, 10/18/2019 ———

20. Fibrosis and Fibromatosis

It is always useful to demonstrate **photos of the involved extremities**, eventually with marks on the palpable findings (circles for nodules, double lines for cords, lightning sign for pain or pressure points, etc.)

Not to confuse the issue, please, differentiate between the two different medical terms **"Fibrosis"** and **"Fibromatosis".** Dupuytren Disease is also often termed in the medical literature as **"Palmar Fibromatosis"** but not as "Palmar Fibrosis" (please check "Wikipedia" on these different terms

1. FIBROSIS = Scarring Process

Fibrosis means the formation of excess fibrous connective tissue with normal tissue (e.g. skin) or organ responding to an injury as part of a reparative or reactive process. If the response is to an injury this process is called scarring, however, if the fibrosis develops from a single (proliferating) cell line the process is called fibroma (i.e. benign tumor).

Fibrosis produces deposits of connective tissue and can disturb or inhibit the normal architecture and function of the underlying organ or tissue. Fibrosis can occur as excessive deposition of fibrous tissue or as a normal process of connective tissue deposition in a normal healing process. Fibrosis results in scarring and thickening of the affected tissues and is an exaggerated wound healing response that interferes with normal organ function.

2. FIBROMATOSIS = Soft Tissue Tumor related to the SARCOMA Family (according to the World Health Organization WHO)
Other names are "musculoaponeurotic fibromatosis" which addresses the tendency of these tumors to be adjacent to and/or infiltrating deep skeletal muscles or the term "aggressive fibromatosis" and/or "desmoid tumor." It comprises a group of soft tissue tumors which have the following characteristics features in common:

- the absence of cytologic (= cellular) and clinical malignant features
- a pathohistology including proliferating well-differentiated fibroblasts
- a locoregional infiltrative growth pattern / spreading in surrounding tissues without forming metastases
- aggressive clinical behavior with local recurrence after surgical resection

There are different disorders possible within this group

- Juvenile fibromatosis
- Fibromatosis colli, which is a non-neoplastic sternocleidomastoid muscle enlargement (in children)
- Infantile digital fibromatosis (of fingers and toes)

- Infantile myofibromatosis (of muscles)
- Fibromatosis hyalinica multiplex
- Penile fibromatosis (occurring as Peyronie's disease in males)
- **Palmar fibromatosis (occurring as Dupuytren's contracture and part of Dupuytren disease**
- Plantar fibromatosis (occurs as Ledderhose disease)
- knuckle pads (occurs as Garrod's disease)

——— Prof. Seegenschmiedt, 3/29/2019 ———

21. Can hand surgery cause Dupuytren's?

Thank you for discussing your many different personal experiences with different types of trauma/hand or extremity surgery with subsequent development of Dupuytren's Disease (DD).

In my long-term clinical experience with more than 1,000 patients treated with radiotherapy for early-stage DD only about 5% have had reported about a previous trauma or surgical treatment in the affected extremity, most of them were patients with carpal tunnel syndrome (CTS) and trigger finger syndrome, a few after a fractured bone and some after Reflex Sympathetic Dystrophy (RSD) syndrome.

Sometimes patients were affected simultaneously with CTS and progressive DD. In those instances, I recommended performing the necessary surgical procedure FIRST, followed by (after an approximate 3-month interval) radiotherapy to stop the possible aggravation of DD.

It is always important to document the "progression" of the disease after a so-called "trigger trauma event" carefully either by counting the number of nodules and cords or change of size of nodules and cords or changes of the surface of the hand palm (pit holes, wrinkles), or any functional changes of the hand etc. Only if these symptoms are obviously changing within a period of 3 - 6 months may radiation therapy (RT) be a good treatment option to stop progression.

——— Prof. Seegenschmiedt, 11/22/2019 ———

22. Hand/Pinky Injury or Dupuytren's Contracture

Acute Trauma and Induction of Dupuytren Disease

This is an interesting question with medical-legal implications, e.g. after accidents caused by a third party. There are a few reviews available in the medical literature which address this topic comprehensively with several points of discussion.

Dupuytren's disease (DD) caused by **repetitive injury** or chronic manual labor has not achieved full credibility so far. However, several studies suggest that the initiation of DD can be induced by an acute or specific injury, infection or surgical procedure to the **ipsilateral hand, wrist or forearm**. Apparently, this occurs more often in patients with a genetic predisposition which was first suggested by Skoog (1948) and proposed definitively by Clarkson (1961) and Hueston (1964). Many reports exist about single case

studies or reviews of a few patients and only a few studies with a large patient population.

An excellent review on 385 patients was published in 2004 by D. Elliot & R. Ragoowansi from the Hand Surgery Department, St. Andrew's Centre for Plastic Surgery, Broomfield Hospital, Chelmsford, Essex, UK [see attached LINK]

These are accepted **CRITERIA FOR RECOGNITION OF DUPUYTREN'S CONTRACTURE AFTER ACUTE INJURY**

1. **Objective evidence of injury** with no evidence of Dupuytren's disease prior to the injury.
2. **Injury is within the same hand, wrist or forearm** as the first hand to develop disease.
3. **Patients may be of any age** and may or may not exhibit conditions predisposing to Dupuytren's Disease or indicative of a diathesis.
4. Dupuytren Disease **appears within 1 year of injury** (surgery, burn, mechanical trauma)
5. **Single nodule or cord** appears first in the palm of the injured hand.
6. **Disease commonly remains limited** to the part of the hand which was initially involved. but may progress within the same hand or to the other hand and may occasionally become significant in degree.

(modified from Elliot and Ragoowansi 2004)

Literature Links:
http://citeseerx.ist.psu.edu/viewdoc/dow...p1&type=pdf / D. Elliot & R. Ragoowansi, 2004

MESH Search in PubMed:
("dupuytren contracture"[Title/Abstract] OR ("dupuytren's contracture"[Title/Abstract] OR ("dupuytren disease"[Title/Abstract] OR ("dupuytren's disease"[Title/Abstract] OR ("dupuytren nodule"[Title/Abstract] OR ("dupuytren's nodule"[Title/Abstract])))))AND ("injury"[Title] OR "trauma"[Title]))

Excellent background information:
https://www.dupuytren-online.info/dupuyt...ure_trauma.html
https://dupuytrens.org/dupuytren-literature-injury/
——— Prof. Seegenschmiedt, 4/13/2019 ———

23. RT following surgery

Radiotherapy after surgery can be divided into two categories of indication (= justified clinical application).

1. Delayed Postoperative Radiotherapy

The performance of radiotherapy for postoperative relapse or progression of Dupuytren Disease (DD) after a previous minimal invasive surgical procedure (PNF) or open surgery - radiotherapy may be only applied in the "early phase" when new nodules - even outside the operated area - are developing and the function deficit of the involved fingers is less than 10 - 30° (tabletop test). Radiotherapy may delay the progression, but there is still no prospective long-term literature data available on this experimental approach.

PubMed: https://www.ncbi.nlm.nih.gov/pubmed/?term=Dupuytren+postoperative+radiotherapy

2. Early Postoperative Radiotherapy

This indication is recently under clinical investigation and still not standard care. The principle idea and concept is to preserve the regained full function of the involved finger rays after a first operation (e.g. for a stage II disease with about 90° bent finger) AND protect the uninvolved hand palm area from a "triggered progression" of DD.

In a multicenter study, this approach is currently tested in a double-blind randomized study against sham treatment by *Dr Jarad Martin, radiation oncologist, Genesis CancerCare, Newcastle NSW AU 2017*.

My personal experience with delayed postoperative radiotherapy (1) involves about 120 patients, while my current experience with selected patients with early postoperative radiotherapy involves about 35 patients since 2014. The "immediate postoperative RT" is applied between 4 - 6 weeks postoperatively after an open procedure with an uncomplicated healing process. The radiation field encompasses the finger rays D2 (index finger) to D5 (little finger); the applied dose concept is 5 x 3Gy within one week, but NO second RT series. I am in the process to collect the follow-up data and plan to present this initial experience in 2019.

Generally, postoperative radiotherapy is not an established or scientifically accepted treatment concept but an experimental procedure not supported by published clinical studies, so far. Thus, it is left to you and the discretion of the physician taking the full risk of possible early and late radiation effects. The informed consent has to include a hint on the incalculable conditions.
——— Prof. Seegenschmiedt, 11/23/2018 ———

24. Can you have RT again at a later date?

In my long-term experience with over 1,000 patients, radiotherapy retreatment after previous radiotherapy was a rare, but possible, solution under certain conditions:

1. There should be a **proven clinical progression of the disease**, i.e. new nodules or cords, without a major functional deficit (maximum 10 - 30-degree extension deficit of digits) which means an early stage of the disease.

2. Proven clinical progression of disease **outside the previously irradiated areas** can be treated with up to 30Gy when there is no overlap with the previous radiotherapy fields.

3. Proven clinical progression of disease **inside the previously irradiated areas** can be treated with an additional 15Gy if there is a discrete region of flare-up (e.g. a new nodule) and the skin conditions are not compromised (e.g. severe dryness or fibrosis after radiotherapy). Thus 45 Gy is the upper dose limit in selected cases. Careful documentation of all treatment fields is an essential precondition

In my experience, several patients had a good benefit from the 3rd radiotherapy series mainly by stopping of further progression of the disease locally. I have never applied a 4th radiotherapy series which would mean a dose of 60Gy.
——— Prof. Seegenschmiedt, 1/25/2019 ———

25. Patchwork-Radiotherapy - Not State of the Art

It is generally not very useful to work in radiotherapy with different abutting radiotherapy fields; only in certain situations a *"shrinking-field-technique"* or a *"field-in-field technique"* is used, e.g. to cover a high-risk area in the central part of the RT-fields. In general, abutting fields create inhomogeneous irregular dose distributions, which may have undesired consequences (see attached figure - Example for a chest wall radiotherapy plan with three abutting RT-fields A, B, and C)

There are two possible problems involved with this type of "Patchwork Radiotherapy"

1. If the RT fields overlap, an undesired **OVER-DOSAGE (= HOT SPOT)** may result which can induce side-effects in the overlapping zone which are usually not observed in the other regions of the RT-fields.

2. If the RT fields do not abut with each other a more or less broad gap may result in an undesired zone of **UNDER-DOSAGE (= COLD SPOT)** and a possible lesser effect on the target tissue than intended.

Moreover, one has to keep in mind, that on any **RT field edge** of a radiotherapy portal an under-dosage region has to be accepted anyway due to lesser secondary electron interactions in the peripheral than in the central zone of the RT field. Therefore, the marked skin line of the RT-field edges often does not reflect the lines at which a full 100% RT-dose is already reached. This may be at 5 - 10 mm "inwards" depending on the type and energy of radiation (electrons, orthovoltage-X-rays).

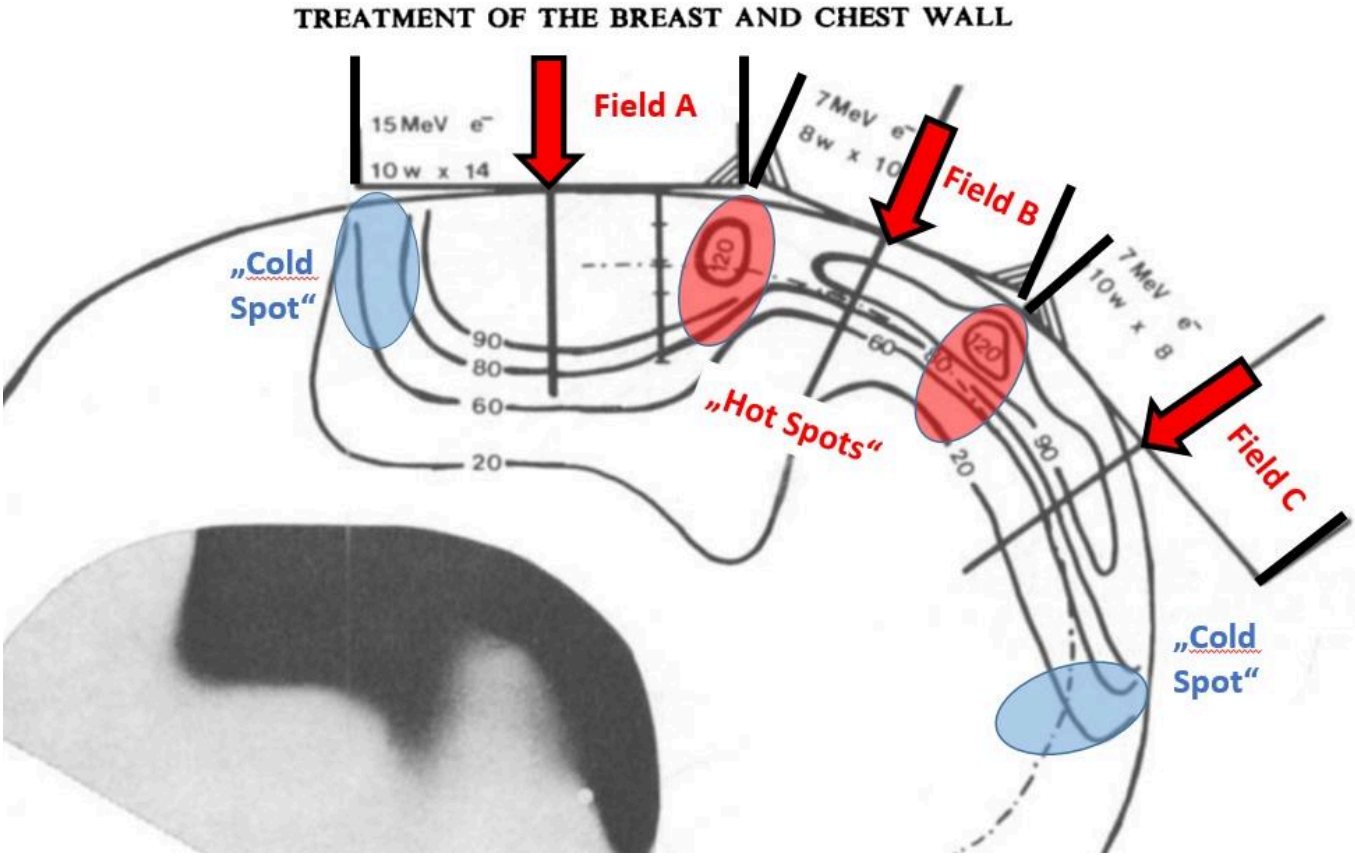
The attached figure explains this situation for three abutting RT-fields with the typical "cold spots" (Blue zone --> < 80% RT dose) on the field edges and the possible "hot spots" (Red --> > 120% RT-dose on the overlapping RT fields).

The unclear "actual situation" of the poster reflects a probably lesser experienced physician with regard to the initial examination and palpation (or palpatory skills of the physician) for the initial preparation and planning of the RT-field of the DD hand palms.

This lack cannot be compensated by a later **"patchwork RT dose pattern"** for different regions of the affected hand palm. Photographic documentation should be a requirement for any chosen field set-up.

My advice would be to stick with the 30 Gy (including two RT-series of each 15 Gy) protocol and await if a relapse/progression may possibly occur in the future at the lesser irradiated area which might then be treated with a 3rd RT-series.

Overall this approach is not the "State of the Art Radiotherapy".
——— Prof. Seegenschmiedt, 6/8/2019 ———



26. Dupuytren, genes red wine, frozen shoulder and L-Glutamine

Radiation oncologists are not bad doctors because they may use possibly damaging ionizing radiation, however, they might be experienced in terms of the examination and evaluation of the **early disease stages** of Dupuytren and Ledderhose Disease. The recommendation at the present time would be a diligent physical examination of both hands and feet by an experienced physician with good knowledge of both Dupuytren and Ledderhose Disease, including high-res photographic documentation to demonstrate where you might have nodules and cords for comparison with later findings.

Afterward, you should compare these initial clinical findings and symptoms with systematic follow-up examinations at about 3, 6 and 12 months by the same doctor to assess whether you might have a **progressive development of the disease** (nodule number and size, cord number and size; change of function, increasing symptoms, etc.).

Radiation therapy is only applied in the "progressive phase" while no or only minimal functional deficit has occurred - a situation in which neither needle aponeurotomy (NA), percutaneous needle fasciotomy (PNF) nor any open surgical procedure has a justified role.

If you apply **radiation therapy at the correct time period** (i.e. "not too early and not too late") you might have about a 90% chance that no other measures have to be taken in the treated extremities (affected

hand palms and foot soles) in the future for more than 10 years. At least that is the documented evidence from several RT studies with long-term follow-up.

I include an evaluation sheet below, which I use for patients which I follow over a longer time with or without previous RT, for your use and structured evaluation.

[Prof. S. responding to a forum post] … it is still not clear **why, when and at which location of your hand** you received your initial needle aponeurotomy (NA) which is usually reserved for more advanced Dupuytren Disease with a functional deficit of one or more finger rays of about or more than 30 degrees. Each invasive procedure including NA means an additional trauma to the affected hand which can immediately enhance the disease progression; thus, it is very well possible that you have further progressive disease after the NA not only at the site of the intervention but also on other sites of the hand palm and fingers. During this progressive phase of formation of new nodules and first cords while still having full function in all fingers is the best time period to apply radiation therapy (RT); RT may be performed after NA, if all fingers have reached full function (i.e. no extension deficit). While NA only works at a "local spot", RT can be addressed to all affected regions of the hand palm including a "safety margin" around the palpable nodules and cords. RT should be applied if there is an objective **change of signs and symptoms** (see attached photograph).

The basic effect of ionizing radiation is to stop the proliferation of active fibroblasts and to reduce the local inflammation. The results of RT becomes less successful if the disease has already led to some contraction and loss of finger function. In this phase, the "radiosensitive" cell population is diminished or has disappeared.

If RT is applied at the right time period the efficacy is in the range of 90% and later procedures like NA, collagenase injection or open hand surgery are quite unlikely (about 10% progression despite RT), but they are still possible and not compromised.

Your actual thoughts and doubts about the disease development are well understood, but the first step is the careful assessment of your current status, the proof of progression and then, step-by-step, the use of available treatment options in the correct order and according to the stage of your disease.
——— Prof. Seegenschmiedt, 12/16/2018 ———
→ see attachment 5B

27. What about an auto-immune diet?

The clinical trial cited https://clinicaltrials.gov/ct2/show/NCT03180957 has tested patients with **advanced stages of Dupuytren Disease**, who already need to undergo open hand surgery. Prior to the planned operation the drug adalimumab (Humira (R)) was injected into one affected nodule, which was surgically removed 14 days after the injection. Since the trial is randomized the other treatment arm consists of pure saline injection into the affected nodule. The potentially effective dose of the drug which will be injected has not been established yet, thus a dose escalation was planned in the treatment arm.

The interim-results of this ongoing study have been published in July 2018 https://www.ncbi.nlm.nih.gov/pubmed/29983350?dopt=Abstract

In the second part of the study, the injection of adalimumab (Humira (R)) in the early **stages of Dupuytren**

Disease is tested. Dupuytren Disease with multiple nodules and cords is not addressed in this ongoing study.

So far, the overall conclusion - NO RECOMMENDATION as a DIET for early or late stages of Dupuytren Disease.
——— Prof. Seegenschmiedt, 12/17/2018 ———

28. Ledderhose - First Signs and Key Symptoms

In general, PAIN is always to be considered as an "alarming sign" from our body which should always be taken seriously if it stays for a prolonged period of time. Pain at the foot (sole) can be caused by a local infection, joint disorder (arthrosis or arthritis), tendon disorder (tendinitis or inflammation of the tendon insertion zone), insufficient vascular supply (e.g. by arteriosclerosis) or nerve root entrapment or metabolic disorders (e.g. diabetic polyneuropathy).

The **key symptoms** of Plantar Fibromatosis (Ledderhose Disease) are the growing nodules and eventually cords that form within and in between the tissue layers of the plantar fascia and the skin surface on the soles of the feet. The typical affected anatomical zones are marked in the attached figure. According to several studies published in the last few years, most cases of Ledderhose Disease involve initially only one foot, but in the latter stages of the disease, more than 25 percent of cases may involve clinical signs (nodules, cords, symptoms) on both feet.

FIRST SIGNS & KEY SYMPTOMS

- subjective sensation of "tightening" of the skin of the foot, but usually no visible wrinkles
- itching, burning or stinging sensations in the surrounding area of the nodules
- pain in the foot as the nodules may grow and compresses nerve routes above and below the plantar fascia
- rarely pain in the foot and ankle joints, which may be made worse by favoring this foot (weight-bearing etc.)

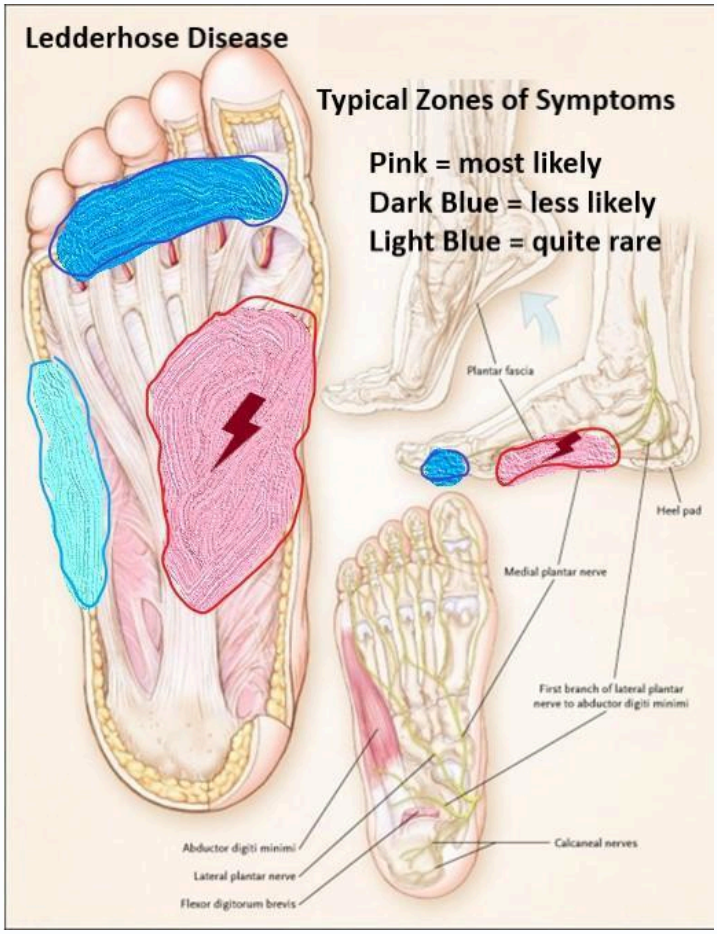
In rare cases the foot balm and the spaces between the toes can also show some signs of the condition (especially nodules). The rear part of the foot is normally not involved. If nodules appear on the backside of the toes, the pressure from these nodules in the foot can cause pain by irritation of the nerve roots and thereby may induce the toes to contract.

DIAGNOSIS OF THE DISORDER

The correct process of diagnosing Ledderhose Disease is important for further treatment. Clearly, an experienced and qualified physician (orthopedic specialist, podiatrist, etc.) is the only person who should diagnose this condition by visible, palpatory and functional examinations. However, not every nodule on the foot is a sign of a Ledderhose condition. Those different disorders will require different therapeutic strategies. Some conditions may be serious, and self-diagnosis can put a person at risk of improper treatment, e.g. in case of a benign or malignant soft tissue tumor such as the diagnosis of aggressive fibromatosis (desmoid tumor). Others may be less harmful like a painful ganglion cyst, which can be operated easily.

Experienced physicians can often identify the disease based on the typical location, size, and type of nodule a person has. In some cases, physicians may order imaging, e.g. X-rays, CT-scans, ultrasound, magnetic resonance imaging to help confirm the diagnosis. I personally prefer the 3D magnetic resonance imaging as it depicts the best details of the existence and actual extension and dimensions of the nodules and cords in the foot sole.

Prof. Dr. med. M. Heinrich Seegenschmiedt / http://www.radiologie-am-stern.de/ueber-uns/
——— Prof. Seegenschmiedt, 7/5/2019 ———



29. First signs and symptoms of Ledderhose Disease

A SHORT OVERVIEW

The **key symptoms** of Plantar Fibromatosis (Ledderhose Disease) are the growing nodules and eventually cords that form within and in between the tissue layers of the plantar fascia and the skin surface on the soles of the feet. The typical affected anatomical zones are marked in the attached figure. According to several studies published in the last few years, most cases of Ledderhose Disease involve initially **only one foot**, but in the latter stages of the disease, more than 25 percent of cases may involve clinical signs (nodules, cords, symptoms) o**n both feet**.

FIRST SIGNS & KEY SYMPTOMS

> subjective sensation of "tightening" of the skin of the foot, but usually no visible wrinkles
> itching, burning or stinging sensations in the surrounding area of the nodules

> pain in the foot as the nodules may grow and compresses nerve routes above and below the plantar fascia
> rarely pain in the foot and ankle joints, which may be made worse by favoring this foot (weight-bearing etc.)

In general, PAIN is always to be considered as an "alarming sign" from our body which should be taken seriously, if it stays for a prolonged period of time. Important: Pain at the foot (sole) can be caused by a local infection, joint disorder (arthrosis or arthritis), tendon disorder (tendinitis or inflammation of the tendon insertion zone), insufficient vascular supply (e.g. by atherosclerosis) or nerve root entrapment or metabolic disorders (e.g. diabetic polyneuropathy).

In rare cases, the foot balm and the spaces between the toes can also show some signs of the condition (especially nodules). The rear part of the foot is normally not involved. If nodules appear on the backside of the toes, the pressure from these nodules in the foot can cause pain by irritation of the nerve roots and thereby may induce the toes to contract.

DIAGNOSIS OF THE DISORDER

The correct process of diagnosing Ledderhose Disease is important for further treatment. Clearly, an experienced and qualified physician (Orthopedic Specialist, Podiatrist, etc.) is the only person who should diagnose this condition by visible, palpatory and functional examinations. However, not every nodule on the foot is a sign of THIS LD condition. Those different disorders will require different therapeutic strategies. Some conditions may be serious, and self-diagnosis can put a person at risk of improper treatment, e.g. in case of a benign or malignant soft tissue tumor such as the diagnosis of aggressive fibromatosis (desmoid tumor). Others may be less harmful like a painful ganglion cyst, which can be operated easily.

Experienced physicians can often identify the disease based on the typical location, size, and type of nodule a person has. In some cases, physicians may order imaging, e.g. X-rays, ultrasound, CT scans or magnetic resonance imaging to help confirm the diagnosis. To my mind, magnetic resonance imaging is the best method to evaluate the existence and extension of Ledderhose Disease.

Here are three LINKS to recent publications which address the diagnostic process and describe imaging procedures:

https://www.ncbi.nlm.nih.gov/pmc/article.../orr-11-001.pdf (2019)

https://www.ncbi.nlm.nih.gov/pmc/article.../SMJ-60-230.pdf (2019)

https://www.ncbi.nlm.nih.gov/pmc/article...2015-741461.pdf (2015)
——— Prof. Seegenschmiedt, 7/5/2019 ———
→ see attachments

30. Alcohol as a Risk Factor for Dupuytren and Ledderhose Disease?

What do we really know?

Before the **1950s** only a single case was reported in the literature in which the excessive use of alcohol was considered as an etiological factor for DD. In another study a higher incidence of DD was found among patients of a liver unit for **chronic alcoholic patients with cirrhosis** of the liver; they had a prevalence of 66% for DD while alcoholic patients without liver cirrhosis had only 27% DD. As other studies in the 1960s confirmed this finding, the **belief that alcohol was an etiological factor** became established in the medical community.

Later the knowledge became more diverse: **Liver disease** was considered as an etiological factor for DD in **patients with epilepsy** and long-term phenobarbital treatment, which can impair the liver function. In the late 1980s, a clinical study examined over 400 patients and found a prevalence between alcoholic patients with and without liver disease. This led to the conclusion that alcohol rather than liver disease was associated with DD. However, it was noted that in those patients with chronic cirrhotic liver disease, the presence of DD strongly suggested an alcoholic cause, with a 90% positive predictive value.

Thus, it appears nowadays that alcohol has a role in the etiology of DD, although it is not clear if this relation is only true in alcoholic patients (i.e. with alcohol addiction), or if those who drink more alcohol have a higher incidence of the disease. This hypothesis was examined in a group of Chelsea pensioners during the early 1990s, and it was found that DD was not more common in those persons who drank more alcohol.

In summary, it seems that *alcoholic patients* (i.e. those with alcohol addiction) have an increased prevalence of DD. However, it should be always remembered that most of those with DD are not alcoholic patients per se. As some recent studies have supported the **role of smoking** in the etiology of DD, it has been speculated that heavy smoking - which is more common in alcoholic patients - may explain the high prevalence of DD in this group.

The mechanism whereby alcohol intake is associated with DD is still unclear. Suggestions include negative effects on the local perfusion or circulation in the palm, damage to the subcutaneous fatty tissues which may induce a fibrotic response, and eventually changes in the prostaglandin synthesis, but none of these mechanisms have been clearly established.

Enclosed are a few published clinical studies which address the topic of alcohol consumption.

1. A Danish study concluded that alcohol intake and tobacco smoking are independently associated with increased risk of DD and the combination of the two conveys a very large risk.

https://www.ncbi.nlm.nih.gov/pubmed/15485739 - 2004

2. The outcome of a **very large UK study** with 97,537 miners seeking compensation for Hand-Arm Vibration Syndrome. The prime determinant of DD prevalence was age; thus, all other factors investigated were corrected for age. There was no statistically significant correlation between years of exposure to vibration and prevalence of DD, but there was a statistically significant association with

smoking, alcohol consumption and diabetes mellitus, with the heaviest smokers having an increased odds ratio (OR) of 1.31, the heaviest drinkers (> 22 units a week) an increased OR of 1.59, and patients with diabetes mellitus an increased OR of 1.52 (95% CI 1.30, 1.77).

https://www.ncbi.nlm.nih.gov/pubmed/17950195

3. The results of a Dutch study showed a high prevalence of the nodular form of DD in The Netherlands. The prevalence increased with age, from 4.9 percent in participants aged 50 to 55 years to 52.6 percent among those aged 76 to 80 years. Men were more often affected (26.4 percent) than women (18.6 percent). Other significant risk factors were previous hand injury, **excessive alcohol consumption,** the familial occurrence of Dupuytren disease, and presence of Ledderhose disease.

https://www.ncbi.nlm.nih.gov/pubmed/23897337

4. In a **large French cohort study**, DD in men was associated with high levels of alcohol consumption and exposure to hand-transmitted vibration. It is likely that the same applies to women.

https://www.ncbi.nlm.nih.gov/pubmed/24477316 - 2014
——— Prof. Seegenschmiedt, 8/4/2019 ———

31. How to contact Prof. Seegenschmiedt

I am still actively practicing and treating patients in our private practice in Essen, Germany
http://www.radiologie-am-stern.de/ueber-uns/
using my official e-mail prof.seegenschmiedt@googlemail.com and will usually respond within 24 hours to patients' requests related to the use of radiotherapy for Dupuytren and Ledderhose Disease.

Additional hints for planning a trip to Essen, Germany
→ see attachments labeled Visit

These hints should help interested clients and potential patients to reach me personally at **Radiotherapy Practice RADIOLOGIE AM STERN** - Bertoldstrasse 1 - 3, 45133 Essen (Germany) for private personal consultations by myself on weekends (Saturdays) together with my colleague Dr. Sedat Yilmam Telefon: +49.201.7998690 / Fax: +49.201.773429 - You may ask for Mrs. Mielke, Mrs. Rademacher or Mrs. Althaus

E-mail: info@radiologie-am-stern.de / Web Site: www.radiologie-am-stern.de

Potential candidates and patients may send a short request for an appointment with a brief history of the disease and representative photographs of the affected hand palm(s) or foot sole(s) to the following email address:

prof.seegenschmiedt@gmail.com or prof.seegenschmiedt@googlemail.com

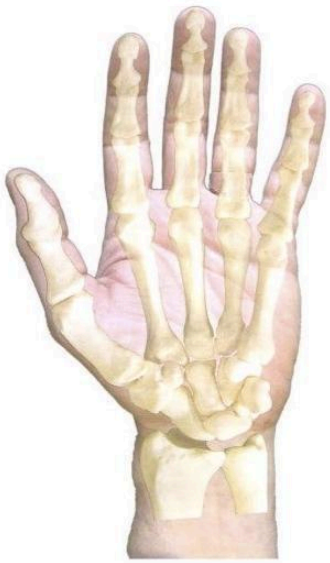
SEE ATTACHMENTS BELOW

Attachment 2.1

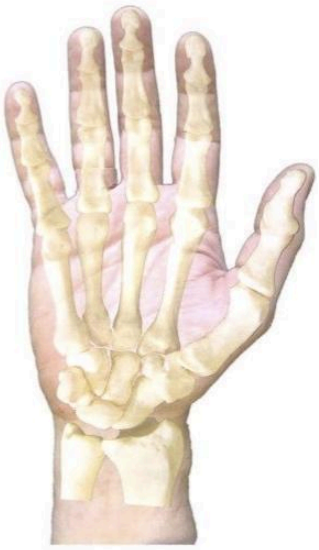
Dupuytren Disease – Clinical Examination	Institution:

Date ⌊ ⌋⌊ ⌋⌊ ⌋ before radiotherapy / **..... Months or ..... Years after Radiotherapy**

Name ..... **Date of Birth** ..... **/ Age** .....



Left **M** **Right**



Summary of Clinical Symptoms & Observations:

Right Hand **(0 = "stable" / ↑ = "increased" / ↓ = "reduced" by % .... Percent)**

Number of Nodules		**Size of Nodules**	
Number of Cords		**Lenth of Cords**	
Clinical Symptoms		**Function / Grip, Table-Top-Test etc.**	
Subjective Result (Patient):			
Objective Result (Physician) ⌊ ⌋ **Remission** ⌊ ⌋ **No Change** ⌊ ⌋ **Progression**			

Left Hand **(0 = "stable" / □ = "increased" / □ = "reduced" by % .... Percent)**

Number of Nodules		**Size of Nodules**	
Number of Cords		**Lenth of Cords**	
Clinical Symptoms		**Function / Grip, Table-Top-Test etc.**	
Subjective Result (Patient):			
Objective Result (Physician) ⌊ ⌋ **Remission** ⌊ ⌋ **No Change** ⌊ ⌋ **Progression**			

Photographic Documentation / Hand Sketch of Findings and Defined Radiation Portal !

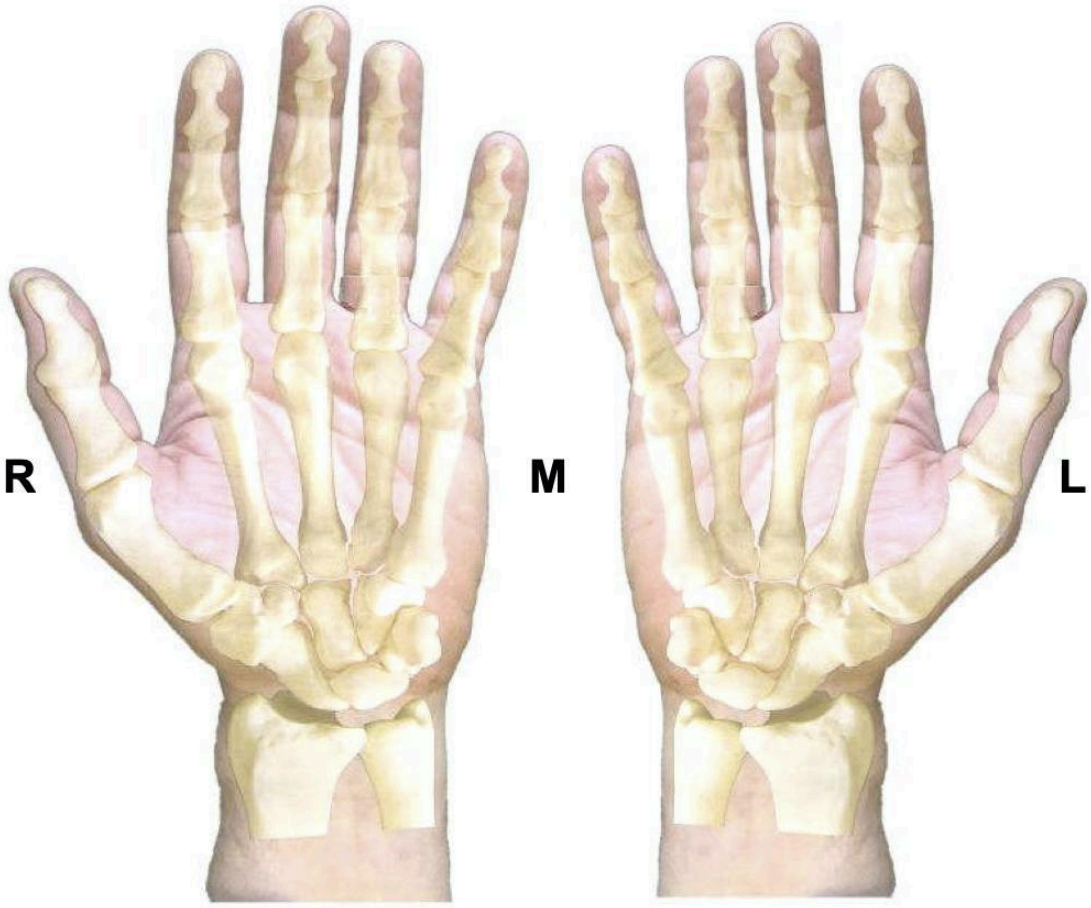
Additional Notes:

Date / Signature (Patient / Physician): .....

Attachment 2.2

Dupuytren Disease – Clinical Examination	Institution:

Hand Sketch or Photographic Documentation:



Right Hand - Stage **Left Hand - Stage**

Nodules

Cords

Finger Deficit
Reduced Angle

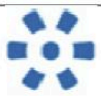
Function Change

Pain Symptoms

Other Signs

3A1

Dupuytren Disease - Basic Data Documentation



Date of 1st Assessment ⌊ ⌋⌊ ⌋⌊ ⌋ **Prior to Radiotherapy**

Family Name ..... **First Name** ..... **DOB** ⌊ ⌋⌊ ⌋⌊ ⌋

General Data : **Please cross (with "X") or mark with N = No / Y = Yes**

Any Relatives with M. Dupuytren ? ⌊ ⌋N ⌊ ⌋Y, Who ? .....

Similar disorders present ? ⌊ ⌋Peyronie Disease ⌊ ⌋Ledderhose Disease

..... ⌊ ⌋Knuckle Pads ⌊ ⌋Keloid(s)

Other disorders present ? ⌊ ⌋Diabetes mellitus ⌊ ⌋Epileptic Disorder

..... ⌊ ⌋Liver Disease ⌊ ⌋Perfusion Disorder ,

..... ⌊ ⌋Thyroid Disease ⌊ ⌋Other Disorder:

Smoking ⌊ ⌋N ⌊ ⌋Y, ... ⌊ ⌋Drinking Alcohol / per day or week: .....

Trauma of the Arm / Hand / Palm ? ⌊ ⌋Which ? / When ? .....

Type of Professional / Daily Activities ? ⌊ ⌋Coarse ⌊ ⌋Fine Hand Strain ?

Which Profession: ..... Which Sports: .....

Dominant Hand ? ⌊ ⌋Right ⌊ ⌋Left ⌊ ⌋Both

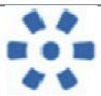
First Onset of Clinical Signs ? ..... (estimate in months)

Which Clinical Signs ?	**Right Hand**		**Left Hand**	
		When ?		When ?
Iching / Burning Sensation ?	⌊ ⌋**N**	⌊ ⌋**Y**	⌊ ⌋**N**	⌊ ⌋**Y**
Increased Palm Tension ?	⌊ ⌋**N**	⌊ ⌋**Y**	⌊ ⌋**N**	⌊ ⌋**Y**
Increased Pressure at Grip ?	⌊ ⌋**N**	⌊ ⌋**Y**	⌊ ⌋**N**	⌊ ⌋**Y**
Pain at Rest ?	⌊ ⌋**N**	⌊ ⌋**Y**	⌊ ⌋**N**	⌊ ⌋**Y**
Pain at Strain ?	⌊ ⌋**N**	⌊ ⌋**Y**	⌊ ⌋**N**	⌊ ⌋**Y**
First Skin Changes ?	⌊ ⌋**N**	⌊ ⌋**Y**	⌊ ⌋**N**	⌊ ⌋**Y**
First Palpable Nodules ?	⌊ ⌋**N**	⌊ ⌋**Y**	⌊ ⌋**N**	⌊ ⌋**Y**
First Palpable Cords ?	⌊ ⌋**N**	⌊ ⌋**Y**	⌊ ⌋**N**	⌊ ⌋**Y**
First Flexion Deformity ?	⌊ ⌋**N**	⌊ ⌋**Y**	⌊ ⌋**N**	⌊ ⌋**Y**
Functional Problems (Grip etc.) ?	⌊ ⌋**N**	⌊ ⌋**Y**	⌊ ⌋**N**	⌊ ⌋**Y**

Further Notes:

3A2

Dupuytren Disease - Basic Data Documentation



Did any of the clinical signs / symptoms recently increase ?

⌊ ⌋N ⌊ ⌋Y, within / during ⌊ ⌋the last 4 weeks : .....

⌊ ⌋the last 3 months : .....

⌊ ⌋the last 12 months : .....

⌊ ⌋the last ⌊ ⌋years : .....

Was there any „regression“ ? ⌊ ⌋N ⌊ ⌋Y, How long ? .:.....

Which physicians did you counsel ? ⌊ ⌋Family Physician ⌊ ⌋Medical Specialist : .....

.....

Which treatment has been conducted so far for one hand / both hands or feet?

Treatment :	**Right Hand**	**Left Hand**
Medication ⌊ ⌋**N** Steroids ⌊ ⌋**N** Antiphlogistic Drugs ⌊ ⌋**N** Allopurinol ⌊ ⌋**N** Vitamines ⌊ ⌋**N** „Enzymes“ ⌊ ⌋**N** „Softening Agents“ ⌊ ⌋**N** Others, specify :		
Hand Surgery : ⌊ ⌋**N** (Year, Type)		
Lokal Injections ⌊ ⌋**N** Corticosteroids / Collagenase ?		
Lokal Ointments ⌊ ⌋**N**		
Radiation Therapy ⌊ ⌋**N** Site / Area / Dose		
Others / Nutrition:		

Further Notes:

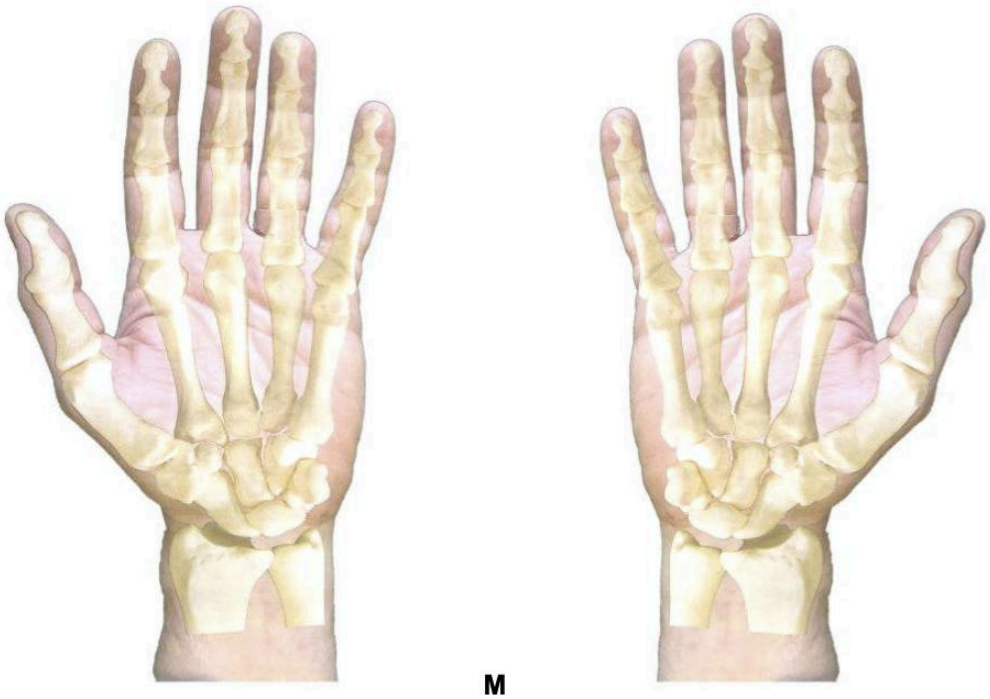
3B

Morbus Dupuytren – Clinical Findings

Actual Date ⌊ ⌋⌊ ⌋⌊ ⌋ / ..... **months or** ..... **years after Radiotherapy**

Family Name ..... **Surname** ..... **DOB** ⌊ ⌋⌊ ⌋⌊ ⌋

Notes & Sketch for Description



L **M** **R**

Summary of Symptoms & Observations

Right Hand **(0 = "stable" / ↑ "increased" ↓ "decreased" by % .... percent)**

No. of Nodules		**Size of Nodules**	
No. of Cords		**Length of Cords**	
Symptoms		**Function / Grip, Spreading etc.**	
Overall Stage			

Left Hand **(0 = "stable" / ↑ "increased" ↓ "decreased" by % .... percent)**

No. of Nodules		**Size of Nodules**	
No. of Cords		**Length of Cords**	
Symptoms		**Function / Grip, Spreading etc.**	
Overall Stage:			

Notes:

Date / Signature: .....

3C.1

Radiologie am Stern, Bertoldstrasse 1-3, 45130 Essen (Germany)
Prof. Dr. med. M.Heinrich Seegenschmiedt; Dr.med. Sedat Yilmam
E-Mail: prof.seegenschmiedt@googlemail.com or use direct link:
praxis@radiologie-am-stern.de / radiologie.am.stern@gmail.com

Information about Radiotherapy for Dupuytren and Ledderhose Disease

Dear Patient,

You have been diagnosed with Morbus Dupuytren (Dupuytren's Disease) of the palm and / or Morbus Ledderhose of the foot sole. Among the various conservative treatment options you are currently exploring the possibility of radiation treatment, which is not performed with sufficient experience or not available in your country due to lack of equipment and /or lack of medical experience or lack of medical training or it is more expensive.

Clinical Experience

Our Radiotherapy Practice in Essen is well equipped and provides a long-term clinical expertise of well experienced physicians who have been involved in the treatment of Morbus Dupuytren / Morbus Ledderhose since more than two decades. This is well documented by peer-reviewed publications and in several internet blogs for patients and medical experts, e.g. http://www.dupuytren-online.info/dupuytren_literature.html

Documentation

It is very important to document the exact disease record including the family history, the professional activities, additional disorders (like Diabetes etc.) and the course of disease in your specific situation. All details will be documented in a questionnaire and data format. All findings from the physical examination are documented together with a photograph of all involved extremities.

Clinical Findings

Even more important in the treatment decision process is the physical examination by a well experienced physician. The exact number and the distribution of the "nodules" and /or the "cords" and the "functional status" of your hand(s) and feet will be examined to take the appropriate target volume for the possible radiation therapy into account. In addition, it is useful to make some drawings and take photographs of both of your palms and foot soles, respectively, to document the actual status of the disease prior to any (radiation) treatment. These documents serve as basis for later comparisons in the long-term aftercare period.

Diagnostic Imaging

Diagnostic imigang is not a requirement but can help to enhance knowledge about the depth and full extension oft the lesion in Ledderhose Disease. In long-term follow-up imaging may help to find post-radiotherapy changes oft he nodules in Ledderhose Disease. However, more important are the visual inspection and palpatory examination in the follow-up.

3C.2

Radiologie am Stern, Bertoldstrasse 1-3, 45130 Essen (Germany)
Prof. Dr. med. M.Heinrich Seegenschmiedt; Dr.med. Sedat Yilmam
E-Mail: prof.seegenschmiedt@googlemail.com or use direct link:
praxis@radiologie-am-stern.de / radiologie.am.stern@gmail.com

Treatment Decision & Planning

If you have been found to be an appropriate candidate for radiation therapy (RT) it is necessary to explain the exact procedures to you. This includes:

- *Definition of the target volume of RT* (area of palm, number of fingers);

exact photographic documentation of RT field shape and size

- *Definition of the radiation concept* : currently at our institution

Two radiotherapy series are delivered with a break of 3 months / 12 weeks
each radiotherapy series consists of 5 RT sessions of each 3 Gy up to 15 Gy total dose.

Thus, after completion of two RT series the total dose to the involved sites is 30 Gy.

Follow-Up / Aftercare

If you have been irradiated at our institution we offer you a continuous future observation and evtl. secondary treatments including re-irradiation, surgery or non-invasive procedures.

- *Definition of the aftercare intervals after completion of RT*:

usually aftercare examinations are performed at 3 and 12 months after completion of RT, thereafter every year up to a total of 10 years.

During the aftercare period photographic and functional re-evaluation of your hand(s) or foot (feet) is essential. While the photographic documentation can be mailed via internet, the physical examination should be done by an experienced physician on a yearly basis.

We wish You a good success with radiotherapy, Prof. Dr. Seegenschmiedt, Dr. Yilmam.

3C.3

Radiologie am Stern, Bertoldstrasse 1-3, 45130 Essen (Germany)
Prof. Dr. med. M.Heinrich Seegenschmiedt; Dr.med. Sedat Yilmam
E-Mail: prof.seegenschmiedt@googlemail.com or use direct link:
praxis@radiologie-am-stern.de / radiologie.am.stern@gmail.com

Typical schedule for radiotherapy of Morbus Dupuytren / Morbus Ledderhose

Week 1 / Day 1

1. Administrative Procedures (5 – 10 minutes)
2. Consultation & Examination by Physician (20 – 30 minutes)
3. Photographic documentation & RT planning (5 – 10 minutes)
4. Informed Consent with Patient's Approval (5 – 10 minutes)

Day 1 or 2 until Day 5 or 6 : Performance of 1st RT-series

1st Radiation Treatment of 1st RT-series with Photographic Documentation
2nd to 5th Radiation Treatment
Control of Skin and Subcutaneous Tissue and Hand Function at last day of RT

Week 3 – Week 12 : Treatment Break

Observation of Skin Changes, Development of Nodules & Cords
Observation of Hand & Finger / Foot & Toe Functionality

Week 13 - 16 / Day 1 – Day 5 : Performance of 2nd RT-series

1st Radiation Treatment of 2nd RT-series with Photographic Documentation
2nd to 5th Radiation Treatment
Control of Skin and Subcutaneous Tissue and Hand Function at last day of RT

Week 14 – Week 26 : Follow-Up 3 months

Observation of Skin Changes, Development of Nodules & Cords
Observation of Hand & Finger / Foot & Toe Functionality

Week 27 - 30 (3 – 4 months aftercare) and week 66 – 70 (12 months after care)

Observation of Skin Changes, Development of Nodules & Cords
Observation of Hand & Finger / Foot & Toe Functionality

Consultation & Examination by Physician (20 – 30 minutes)

Further Long-term follow-up every year via internet with questionnaire

Observation of Skin Changes, Development of Nodules & Cords
Observation of Hand & Finger / Foot & Toe Functionality

4A.1

Ledderhose Disease - Basic Data Documentation

Date of 1st Assessment ⌊ ⌋⌊ ⌋⌊ ⌋ **Prior to Radiotherapy**

Family Name ..... **Surname**..... **DOB** ⌊ ⌋⌊ ⌋⌊ ⌋

General Data : **Please cross (with "X") or mark with N = No / Y = Yes**

Any relatives with M. Ledderhose ? ⌊ ⌋N ⌊ ⌋Y, Who ? .....

Similar Disorders present ? ⌊ ⌋Peyronie Disease ⌊ ⌋Dupuytren Disease

..... ⌊ ⌋Knuckle Pads ⌊ ⌋Keloid(s)

Other Disorders present ? ⌊ ⌋Diabetes mellitus ⌊ ⌋Epileptic Disorder

..... ⌊ ⌋Liver Disease ⌊ ⌋Perfusion Disorder ,

..... ⌊ ⌋Thyroid Disease ⌊ ⌋Other Disorder:

Smoking ⌊ ⌋N ⌊ ⌋Y, ... ⌊ ⌋Drinking Alcohol / per day or week: .....

Trauma of the Foot / Sole ? ⌊ ⌋Which ? / When ? .....

Type of Professional / Daily Activities ? ⌊ ⌋Coarse ⌊ ⌋Fine Foot Strain ?

Which Profession: ..... Which Sports: .....

Dominant Foot? ⌊ ⌋Right ⌊ ⌋Left ⌊ ⌋Both

First Onset of Clinical Signs ? ..... (estimate in months)

Which Clinical Signs ?	**Right Foot**		**Left Foot**	
		When ?		When ?
Iching / Burning Sensation ?	⌊ ⌋**N**	⌊ ⌋**Y**	⌊ ⌋**N**	⌊ ⌋**Y**
Increased Sole Tension ?	⌊ ⌋**N**	⌊ ⌋**Y**	⌊ ⌋**N**	⌊ ⌋**Y**
Increased Sole Pressure?	⌊ ⌋**N**	⌊ ⌋**Y**	⌊ ⌋**N**	⌊ ⌋**Y**
Pain at Rest ?	⌊ ⌋**N**	⌊ ⌋**Y**	⌊ ⌋**N**	⌊ ⌋**Y**
Pain at Strain ?	⌊ ⌋**N**	⌊ ⌋**Y**	⌊ ⌋**N**	⌊ ⌋**Y**
First Skin Changes ?	⌊ ⌋**N**	⌊ ⌋**Y**	⌊ ⌋**N**	⌊ ⌋**Y**
First Palpable Nodules ?	⌊ ⌋**N**	⌊ ⌋**Y**	⌊ ⌋**N**	⌊ ⌋**Y**
First Palpable Cords ?	⌊ ⌋**N**	⌊ ⌋**Y**	⌊ ⌋**N**	⌊ ⌋**Y**
Gait Disorder (Limp) ?	⌊ ⌋**N**	⌊ ⌋**Y**	⌊ ⌋**N**	⌊ ⌋**Y**
Other Complaints ?	⌊ ⌋**N**	⌊ ⌋**Y**	⌊ ⌋**N**	⌊ ⌋**Y**

Further Notes:

4A.2

Ledderhose Disease - Basic Data Documentation

Did any of the clinical signs increase during the last time ?

⌊ ⌋N ⌊ ⌋Y, within / during ⌊ ⌋the last 4 weeks : .....

⌊ ⌋the last 3 months : .....

⌊ ⌋the last 12 months : .....

⌊ ⌋the last ⌊ ⌋years : .....

Was there any „regression“ ? ⌊ ⌋N ⌊ ⌋Y, How long ? .:.....

Which physicians did you counsel ? ⌊ ⌋Family Physician ⌊ ⌋Medical Specialist :.....

.....

Which treatment has been conducted so far for ⌊ ⌋**one foot /** ⌊ ⌋**both feet or** ⌊ ⌋**hand(s) ?**

Treatment :	**Right Foot**	**Left Foot**
Medication ⌊ ⌋**N** Steroids ⌊ ⌋**N** Antiphlogistic Drugs ⌊ ⌋**N** Allopurinol ⌊ ⌋**N** Vitamines ⌊ ⌋**N** „Enzymes“ ⌊ ⌋**N** „Softening Agents“ ⌊ ⌋**N** Others, specify :		
Foot Surgery : ⌊ ⌋**N** (Year, Type)		
Lokal Injections ⌊ ⌋**N**		
Lokal Ointments ⌊ ⌋**N**		
Radiation Therapy ⌊ ⌋**N** Site / Area / Dose ?		
Others / Nutrition		

Further Notes:

4B

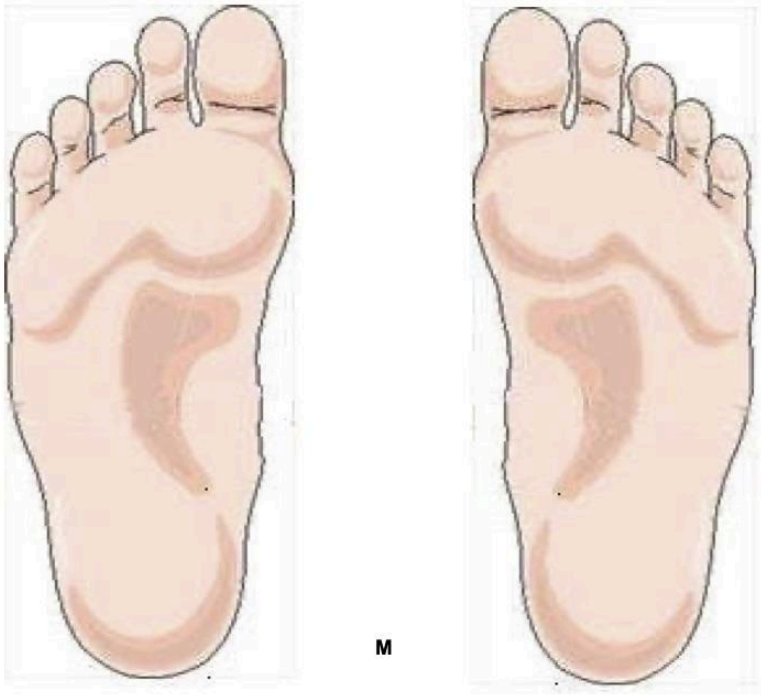
Morbus Ledderhose – Clinical Findings

Actual Date ⌊ ⌋⌊ ⌋⌊ ⌋ / ..... **months or** ..... **years after** ⌊ ⌋ / **before** ⌊ ⌋ **Radiotherapy**

Family Name ..... **First Name** ..... **DOB** ⌊ ⌋⌊ ⌋⌊ ⌋

Notes & Sketch for Description

R **M** **L**



Summary of Symptoms & Observations:

Right Foot **(0 = "stable" / ↑ "increased" ↓ "decreased" by % .... percent)**

No. of Nodules		**Size of Nodules**	
No. of Cords		**Length of Cords**	
Symptoms (Pain, Ichting etc.		**Function / Gait (Profession / Sports)**	
Overall Stage			

Left Foot **(0 = "stable" / ↑ "increased" ↓ "decreased" by % .... percent)**

No. of Nodules		**Size of Nodules**	
No. of Cords		**Length of Cords**	
Symptoms (Pain, Ichting etc.		**Function / Gait (Profession / Sports)**	
Overall Stage			

Notes :

Date / Signature: .....

Follow-Up - Dupuytren / Ledderhose Disease 5A

FOLLOW_UP / Date of Radiotherapy: ..... **Actual Date :** .....

Name: .... **Date of Birth:** .....

Address: .....

Phone: ..... E-Mail: :::::.....

Former Affection: (please tick) **Hand(s):** right hand ☐ left hand ☐ **Feet:** right foot ☐ left foot ☐
Dupuytrens Disease Stage ..... ☐ **Ledderhose Disease Stage** ..... ☐

Overall current situation improved ☺ ☐ or arrow ↑ / unchanged 😐 ☐ or "0" / worse ☹ ☐ or arrow ↓

Affected Extremities	Right ☐			Left ☐			Right ☐			Left ☐		
	☺	😐	☹	☺	😐	☹	☺	😐	☹	☺	😐	☹
Skin retraction												
Nodule size & number												
Cords length & number												
Stretching loss (angle)												
Pain & other signs												
Daily function (s): e.g. Table Top / Gait												

New occurrence of DD or LD in other limbs? **No** ☐ **Yes** ☐ if yes, where?

Notes (Date, Location):
Comments
.....

General Changing Quality of Life? **No** ☐ **Yes** ☐ if yes, how?

Notes (Date, Items):
.....

Further Examinations? **No** ☐ **Yes** ☐ if yes, which:

- visual / specific examination ☐ ultrasound ☐ x-ray ☐ CT or MRT ☐
- other examinations ☐ .....

.....

Further Local Treatments? **No** ☐ **Yes** ☐ if yes, which:

- open surgery (scalpel) ☐ fasciotomy (needle) ☐ collagenase (syringe) ☐
- physiotherapy ☐ other ☐ .....

Overall Satisfaction with Treatment Outcome ? (Please mark on scale plus additional free comments)

☹ ☺

Disappointed **(0) ----- (1) ----- (2) ----- (3) ----- (4) ----- (5) ----- (6) ----- (7) ----- (8) ----- (9) ----- (10)** Very Pleased

5B.1

Radiologie am Stern, Bertoldstrasse 1 - 3, 45130 Essen (Germany)
Prof. Dr. med. M. Heinrich Seegenschmiedt and Dr.med. Sedat Yilmam
E-Mail: praxis@radiologie-am-stern.de / radiologie.am.stern@gmail.com

Follow-up after RT in ..... Month/Year **Actual Date :** .....

Surname, First Name: ..... **Date of birth:** .....

Address: .....

Phone: ..... E-Mail: .....

Former affection: **Right Hand** ☐ / **Left Hand** ☐ // **Right Foot** ☐ / **Left Foot** ☐

(please tick) **Dupuytren Disease** ☐ // **Ledderhose Disease** ☐

Overall current situation improved ☺ ☐ stable / unchanged 😐 ☐ worse ☹ ☐

Affected Location(s)	**Right Hand** 			**Left Hand** 			**Right Foot** 			**Left Foot** 		
	☺	😐	☹	☺	😐	☹	☺	😐	☹	☺	😐	☹
-Skin (reaction)												
-Nodule(s) size & number(s)												
- Cord(s) size & number(s)												
- Stretching loss Gait disorder												
- Pain & other symptoms												

Daily Function(s):

Hands:....., e.g. **Table-Top-Test possible ?**

Feet: ....., e.g. **Normal Gait possible ?**

New Disease in other sites? no ☐ yes ☐ If yes, where?

notes: .....

Changing of Quality of Life? no ☐ yes ☐ If yes, how ?

notes: .....

Further Examinations? no ☐ yes ☐ if yes, which ?:

- Visual / imaging exam ☐ ultrasound ☐ x-ray ☐ CT ☐ or MRT ☐
- Other exams (which) ☐ .....

Further Treatments? no ☐ yes ☐ if yes, which and when:?

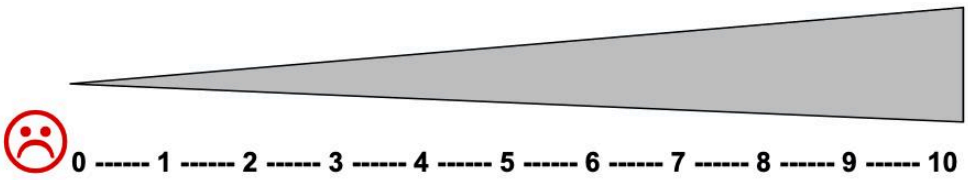
- Surgery (with scalpel) ☐ Fasciectomy (with needle) ☐ Injection (with syringe) ☐
- Physiotherapy ☐ Other Treatments .....

5B.2

Radiologie am Stern, Bertoldstrasse 1 - 3, 45130 Essen (Germany)
Prof. Dr. med. M. Heinrich Seegenschmiedt and Dr.med. Sedat Yilmam
E-Mail: praxis@radiologie-am-stern.de / radiologie.am.stern@gmail.com

Overall satisfaction with the treatment outcome ? Free Text and / or Graph)

Please mark your personal rate of satisfaction with the use of radiotherapy thrrapy :



0 ------ 1 ------ 2 ------ 3 ------ 4 ------ 5 ------ 6 ------ 7 ------ 8 ------ 9 ------ 10

„not satisfied at all“ „not satisfied“ „acceptable“ „partially satisfied“ „highly satisfied“

Add free comments, notes, photographs related to the outcome in the past period of time:

.....

.....

.....

.....

.....

.....

.....

.....

If possible, send photographs of special findings of the affected extremities:

Hand Palm - Right

Hand Palm - Left

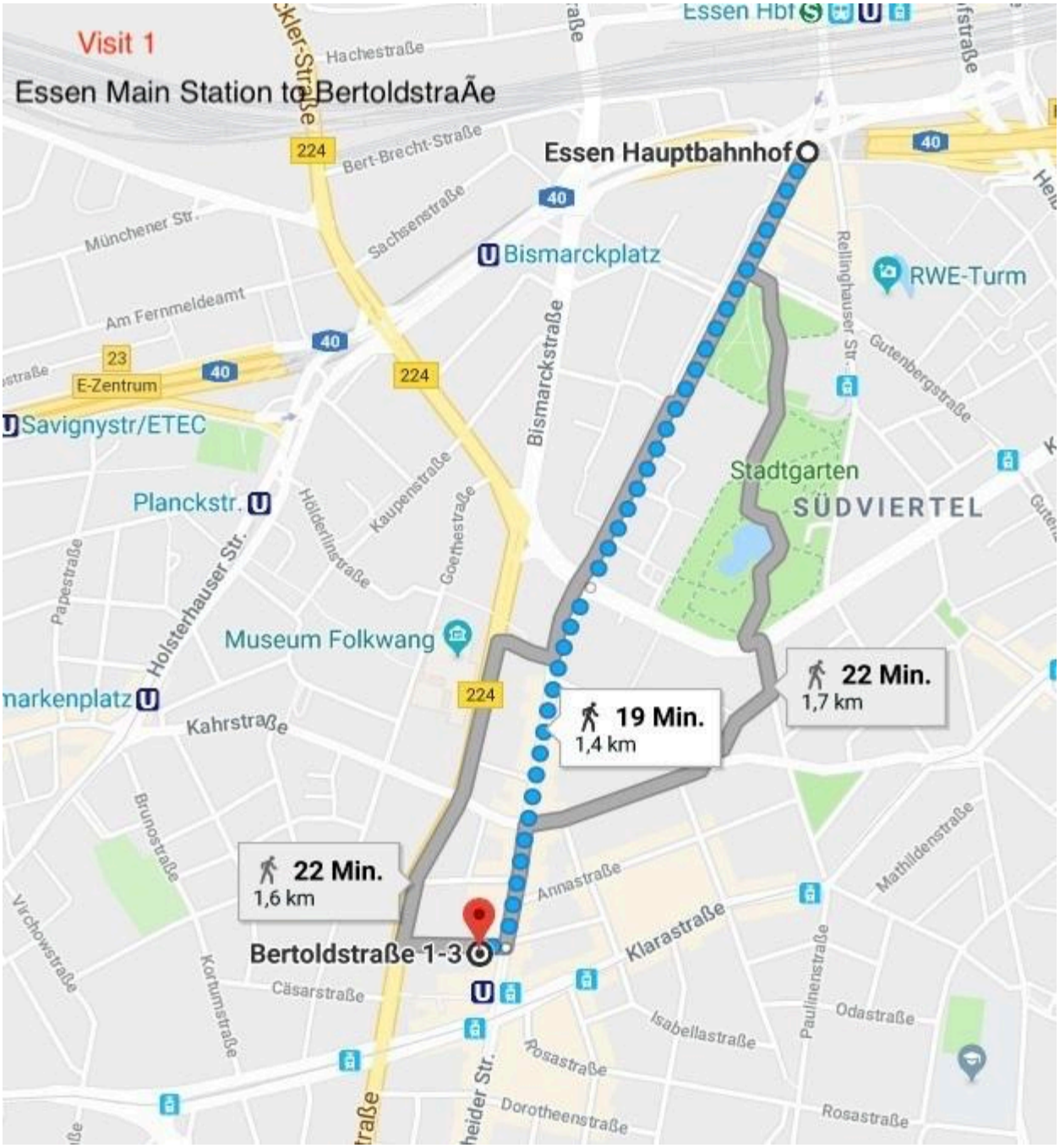
Foot Sole – Right

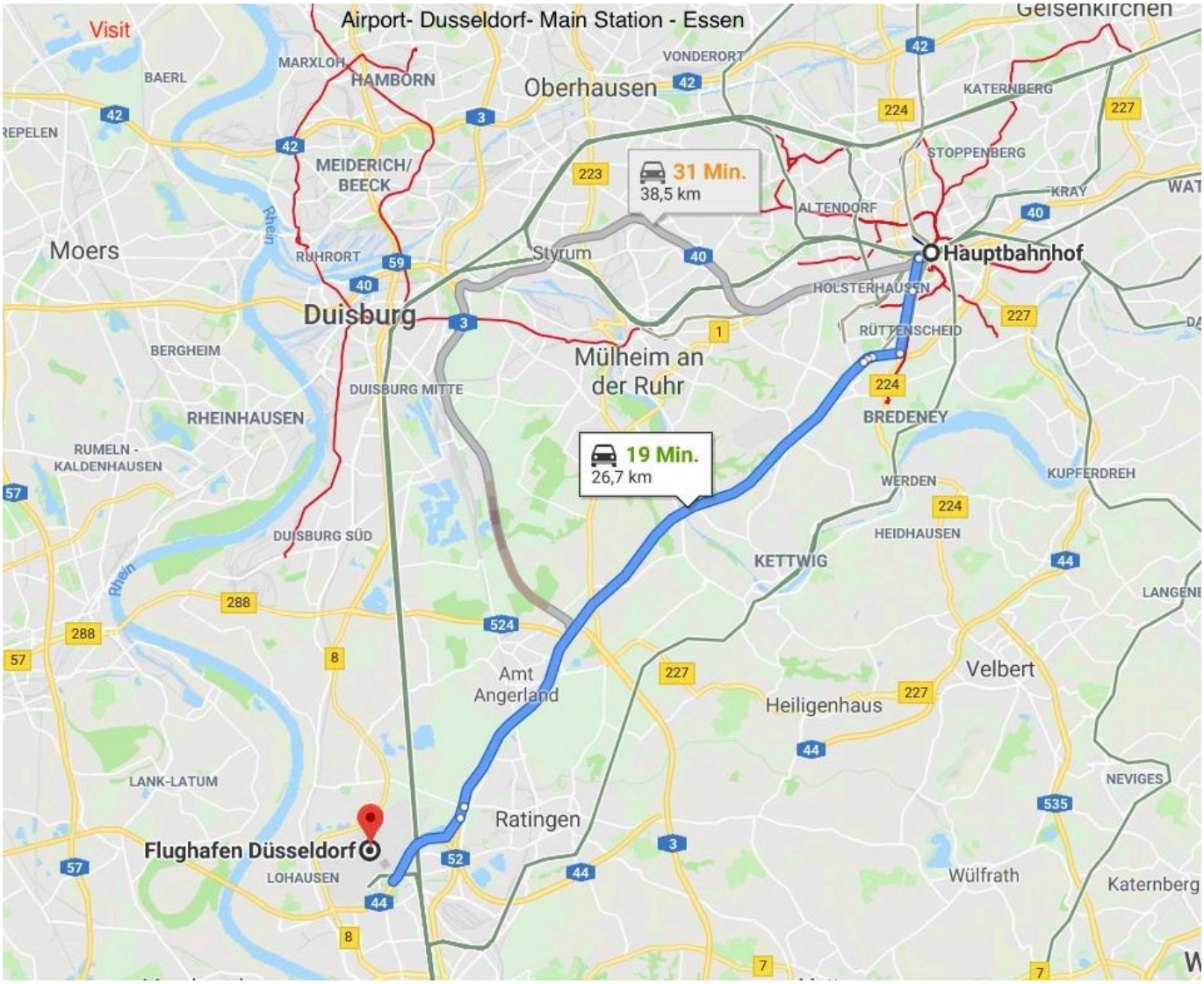
Foot Sole – Left

Special / Other Sites

If possible, send a receipt of E-mail or postal-mail, to affirm your adress

City Date / Patient's Signature : .....


Visit 1
Essen Main Station to BertoldstraÃe
Essen Hauptbahnhof
Bert-Brecht-Straße
Sachsenstraße
Bismarckplatz
RWE-Turm
Am Fernmeldeamt
E-Zentrum
Savignystr/ETEC
Bismarckstraße
Gutenbergstraße
Stadtgarten
SÜDVIERTEL
Planckstr.
Holsterhauser Str.
Kaupenstraße
Goethestraße
Museum Folkwang
22 Min.
1,7 km
19 Min.
1,4 km
Kahrstraße
22 Min.
1,6 km
Annastraße
Klarastraße
Bertoldstraße 1-3
Cäsarstraße
Isabellastraße
Rosastraße
Dorotheenstraße
Odastraße
Mathildenstraße
Paulinenstraße
Brunostraße
Virchowstraße
Kortumstraße
Papestraße
Hachestraße
München Str.
224
40
23


Airport- Dusseldorf- Main Station - Essen
Visit
Gelsenkirchen
BAERL
MARXLOH
HAMBORN
Oberhausen
VONDERORT
KATERNBERG
REPELEN
MEIDERICH/
BEECK
31 Min.
38,5 km
STOPPENBERG
ALTENDORF
KRAY
Moers
Rhein
RUHRORT
Styrum
Hauptbahnhof
HOLSTERHAUSEN
Duisburg
RÜTTENSCHEID
BERGHEIM
Mülheim an
der Ruhr
DUISBURG MITTE
RHEINHAUSEN
BREDENEY
RUMELN -
KALDENHAUSEN
19 Min.
26,7 km
WERDEN
KUPFERDREH
DUISBURG SÜD
HEIDHAUSEN
KETTWIG
Rhein
Amt
Angerland
Velbert
Heiligenhaus
LANK-LATUM
NEVIGES
Ratingen
Flughafen Düsseldorf
LOHAUSEN
Wülfrath
Katernberg

Hotels in Essen:

https://www.google.de/search?q=Essen+Hotel

60 – 80 Euro / night

ALG-Leasing und Hotelbetrieb GmbH

Adresse: Dreilindenstraße 96, 45128 Essen
Telefon: 0201 239253

Hotel Fabritz

27 Google-Rezensionen
2-Sterne-Hotel

Adresse: Klarastraße 68, 45130 Essen (Ruhr)
Telefon: 0201 776462

Hotel Rüttenscheider Stern ★ ★ ★

51 Google-Rezensionen

Adresse: Almastraße 7, 45130 Essen
Telefon: 0201 72400

Brunnen Hotel

49 Google-Rezensionen
3-Sterne-Hotel

Adresse: Friederikenstraße 40, 45130 Essen
Telefon: 0201 879050

Hotel Hoffmann

16 Google-Rezensionen
2-Sterne-Hotel

Adresse: Hedwigstraße 5, 45130 Essen
Telefon: 0201 772784

GHOTEL hotel & living Essen

137 Google-Rezensionen
3-Sterne-Hotel

Adresse: Hachestraße 63, 45127 Essen
Telefon: 0201 170020

80 – 100 Euro / night

Novum Hotel Arosa Essen

96 Google-Rezensionen
3-Sterne-Hotel

Adresse: Rüttenscheider Str. 149, 45130 Essen

Telefon: 0201 72260

Best Western Hotel Ypsilon

117 Google-Rezensionen
4-Sterne-Hotel

Adresse: Müller-Breslau-Straße 18-20, 45130 Essen

Telefon: 0201 89690

Hotel Handelshof

160 Google-Rezensionen
4-Sterne-Hotel

Adresse: Am Hauptbahnhof 2, 45127 Essen

Telefon: 0201 24685300

Hotel Ibis Essen Hauptbahnhof

181 Google-Rezensionen
2-Sterne-Hotel

Adresse: Hollestraße 50, 45127 Essen

Telefon: 0201 24280

Hotel Luise (garni)

29 Google-Rezensionen

Adresse: Dreilindenstraße 96, 45128 Essen

Telefon: 0201 200219

Hotel Bredeney

212 Google-Rezensionen
4-Sterne-Hotel

Adresse: Theodor-Althoff-Straße 5, 45133 Essen

Telefon: 0201 7690

100 – 140 Euro / night

Hotel Rheinischer Hof

68 Google-Rezensionen
3-Sterne-Hotel

Adresse: Hedwigstraße 11, 45130 Essen

Telefon: 0201 781074

Mercure Hotel Plaza Essen

176 Google-Rezensionen
4-Sterne-Hotel

Adresse: Bismarckstraße 48-50, 45128 Essen

Telefon: 0201 878580

Parkhotel

Website
Routenplaner

4,68 Google-Rezensionen
3-Sterne-Hotel

Adresse: Alfredstraße 118, 45131 Essen

Telefon: 0201 779095

ATLANTIC Congress Hotel Essen

249 Google-Rezensionen
4-Sterne-Hotel

Adresse: Messeplatz 3, 45131 Essen

Telefon: 0201 946280

Georges Hotel & Boardinghouse

31 Google-Rezensionen
3-Sterne-Hotel

Adresse: Florastraße 15B, 45131 Essen

Telefon: 0201 74737219

Hotel Waldhaus Langenbrahm

24 Google-Rezensionen
4-Sterne-Hotel

Adresse: Wiedfeldtstraße 23, 45133 Essen

Telefon: 0201 45040

over 140 Euro / night

Sheraton Essen Hotel

155 Google-Rezensionen
4-Sterne-Hotel

Adresse: Huyssenallee 55, 45128 Essen
Telefon: 0201 10070

Hotel an der Gruga

35 Google-Rezensionen
3-Sterne-Hotel

Adresse: Eduard-Lucas-Straße 17, 45131 Essen
Telefon: 0201 841180
