

STATEMENT

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Medicine, Medical University - Sofia,
member of the scientific jury according to order № P-109-110 / 11.03.2022 of the Rector of
the Medical University "Prof. Dr. Paraskev Stoyanov" - Varna

About: Public defense of the dissertation of Dr. Julian Zlatkov Penev for the acquisition of
ONS "Doctor" in the field of higher education 7. Health and Sports, Professional field 7.1.
Medicine, under the doctoral program "Dermatology and Venereology", with the topic of the
dissertation **"OPPORTUNITIES FOR LASER REJUVENATION AND
AESTHETICIZATION OF FACIAL SKIN"**

I. Brief data on the candidate's career development

Dr. Julian Zlatkov Penev was born on April 13, 1959 in the town of Popovo. In 1986
he graduated from the Medical University "Prof. Dr. Paraskev Stoyanov" - Varna.

From 1987 to 2000 he worked at the Biotechnical Institute BIOTECH - Varna and
worked on the application of lasers for medical and biotechnological purposes. Participates in
the construction of new improved industrial prototypes of dermatological laser systems that
effectively affect vascular and pigmented dermatoses, as well as for deep ablative laser
resurfacing with optimized laser pulse parameters. The original author's methodology
"FasetLift" is registered under number 103448 / 22.10.2018 of the Patent Office of the
Republic of Bulgaria.

He worked in the Clinic of Skin and Venereal Diseases of the University Hospital "St.
Marina" -Varna and in the "Outpatient Clinic for Individual Practice for Specialized
Outpatient Medical Care in Dermatology and Venereology - Prof. Zlatko Penev, Varna."

Dr. Penev shows a strong affinity for research in the field of laser medicine and
develops methods and techniques for laser treatment of various dermatoses.
He has participated in many national and international scientific events. In connection with
the developed dissertation, Dr. Penev has presented significant scientific output, represented
by 3 participations in textbooks and teaching aids, 15 publications in Bulgarian collections of
reports and 8 publications in refereed publications with impact factor.

Dr. Penev's documents meet the legal requirements for the development of the
academic staff of Law on the development of the academic staff in the Republic of Bulgarian
and the Rules for the development of the academic staff in the Medical University "Prof. Dr.
P. Stoyanov" - Varna. They are well arranged and contain sufficient evidence.

II. Relevance of the dissertation

The relevance of the dissertation stems from the understanding of the importance of
the quality and appearance of facial skin as an important factor for self-esteem and social life,
confidence and self-realization of the individual. Eliminating the visible signs of aging,
removing unsightly dermatoses and those associated with old age can actually increase self-
esteem and quality of life.

The application of lasers allows for a successful combination of therapeutic and
aesthetic effectiveness for the treatment of a number of dermatoses, for the removal of
pathological skin lesions and for improving the structure and appearance of the skin. With the
increase of living standards and life expectancy, skin aesthetics is constantly gaining more
and more importance, which has encouraged the medical industry to develop new products
and procedures aimed at aestheticizing and rejuvenating the skin.

The present dissertation focuses on laser therapy of dermatoses located on the head and neck with a carbon dioxide (CO₂ laser) laser. These include dermatoses that are difficult to treat with conventional therapies or scarring after them is aesthetically unacceptable - severe acne, multiple seborrheic and solar keratoses, hyperpigmentation, hemangiomas, keloids, scars after burns, injuries, surgeries and surgeons. on the face (fine lines, deep wrinkles, elastosis and melasma). The search for effective, fast and lasting treatment, together with the achievement of good aesthetic results are especially important for the modern patient. Therefore, the in-depth study of laser methods and the optimization of therapeutic techniques used in these conditions is especially relevant in modern dermatological practice.

This work is an experience of the author - a pioneer in the application of laser devices in dermatology, to summarize his own, more than 30 years of clinical experience in the treatment of various dermatoses and procedures that improve the appearance and condition of aging skin. The analysis of the possibilities for application of CO₂ laser in the treatment and aestheticization of facial skin, based on vast photographic material from our own clinical practice and optimized therapeutic techniques achieved on the basis of extensive theoretical knowledge and practical experience are particularly important and make the development of dissertation extremely interesting and up-to-date, contributing to a better understanding of the possibilities for laser rejuvenation and aestheticization of facial skin.

III. Characteristics and evaluation of the dissertation

The dissertation contains 193 standard pages and is illustrated with numerous tables and figures. The literature reference includes 105 literary sources, 20 of which are in Cyrillic. The dissertation contains a huge amount of photo documentation of patients before and after the laser treatment. To realize the goal and tasks of the dissertation and test the hypothesis, methods of comparing photo-documentary material with evaluation of the results in the short and long term are applied.

The purpose of the study is correctly defined and gives the main directions of research work - to optimize, analyze and summarize therapeutic options for aestheticization and rejuvenation of facial skin with laser effects with specific techniques and typical clinical cases in anatomical areas of the head - capillaries, eyelids, ears, lips, nose and neck.

To achieve this goal, 7 tasks are formulated accurately and clearly:

- To make theoretical and biophysical substantiation for optimization of the processes of ablative impact.
- To analyze the types of laser effects - ablation, excision, thermolysis and resurfacing by determining their therapeutic efficacy on conditions and dermatoses associated with unaesthetic appearance and old age: seborrheic keratoses, solar and senile dyschromias, precancerous dermatoses, dermatoses skin elasticity (elastosis) and rhytids.
- To analyze laser therapeutic techniques in anatomical areas of the head and neck.
- To analyze the author's laser procedure for effective treatment of adult and prolonged juvenile acne and erasure of its scars.
- To analyze the possibilities for optimizing ablative laser resurfacing through an author's biophysical model.
- To analyze statistically the changes in self-esteem reflecting the subjective quality of life after aesthetic laser procedures of a control group of patients.
- To specify and formulate conclusions and recommendations for clinical application (clinical protocol).

The dissertation contains a detailed and analytical literature review on the topic, which presents the latest developments, including a critical analysis of the therapeutic application of CO₂ laser. From the creation of real-world laser sources to the present day, opportunities for their application in medicine are constantly being sought. This is due to the unique properties

of laser light - coherence, monochromaticity, directivity, narrow spectral length, high power in continuous and pulsed mode. The review examines in detail the physical basis of laser therapy - physical parameters (energy, power, dose), the characteristics of laser light, laser beam modulation, laser beam guidance and scanning systems and the interactions of laser light with the skin, which is determined from the optical properties of the tissues and ingredients. The appearance of many dermatoses is associated with cultural, cultural-ethnic, religious and other hygienic and hyperhygienic habits and rituals. Evolutionarily, the human face has become a social organ of communication. The person gradually begins to perform non-verbal communicative functions, and rejuvenation and the achievement of a good aesthetic appearance are increasingly exciting humanity. The review analyzes the published therapeutic effectiveness of the CO₂ laser in the treatment of various dermatoses, as well as a critical analysis of laser procedures to rejuvenate facial skin. At this stage, ablative laser effects based on CO₂ and Er: Yag lasers are recognized as the most effective in rejuvenating facial skin.

The literature data from the modern, detailed review prove the relevance of the topic of the dissertation and the usefulness of its development.

In the developed dissertation work are applied modern clinical, diagnostic, epidemiological and statistical methods that are sufficient to solve the tasks to achieve the scientific goal.

This work analyzes the possibilities for application of CO₂ laser in the therapy and aestheticization of facial skin, comparing and analyzing photographic material from our own clinical practice. The therapeutic effectiveness is compared with the effectiveness of other methods known so far on this issue and discusses the approaches developed to achieve maximum aesthetics without compromising with therapeutic radicalism.

The techniques used here are described:

1. fast laser ablation (LFDA-LaserFastDrawAblation);
2. Speed Single Shot Ablation (OSA – OneShotAblation);
3. laser excision and incision;
4. laser thermolysis;
5. fractionated ablative laser resurfacing.

A retrospective non-interventional one-center clinical study was conducted, which includes a representative sample of 100 cases of various dermatoses treated in the period from January 1989 to December 2019 at the Clinic of Skin and Venereal Diseases of University Hospital "St. Marina" -Varna and in "Outpatient clinic for individual practice for specialized outpatient medical care in dermatology and venereology - Prof. Zlatko Penev, Varna."

The medical documentation, routine clinical examinations and photo documentation, as well as the applied laser treatment were analyzed. The obtained results are described in detail and accurately and are illustrated with a large number of photographs, following the set tasks.

The results of aestheticizing and rejuvenating the skin allow to analyze the changes in the self-esteem of patients as a function of these results. Therapeutic-aesthetic effectiveness is analyzed statistically by assessing psychological parameters before and after therapy on a control group of patients. For this purpose, the participants fill in a psychological questionnaire of 2 self-assessment modules:

1. Self-assessment of appearance - The subjects are self-assessed on a scale from 1 to 5, with 1 corresponding to the lowest degree of the measured characteristic, and 5 - the highest degree.
2. Overall self-esteem with 10 questions from the scales Attitude towards yourself and Social confidence. Respondents score their answers on a scale of 1 to 5, with 1 being "very common" and 5 being "almost never".

The statistics are processed in detail using the statistical software package SPSS version 20.

Based on the obtained reliable and representative results, an in-depth discussion was developed and the relevant conclusions were formulated:

1. The therapeutic effectiveness of the application of ablative CO₂ laser effects proves that they are a suitable therapeutic alternative, providing high aesthetics of the end result in the removal of pathological lesions on the face.
2. The developed author's CO₂ laser methodology is effectively effective in the treatment of prolonged juvenile and adult acne, and fractionated ablative procedures can erase the signs of severe acne.
3. Laser resurfacing, performed with optimized parameters is a therapeutic technique for significant reuvelinization of facial skin, which really improves skin texture and elasticity, erases fine and deep wrinkles, corrects acne scars, rough scars caused by trauma, burns and surgeons.
4. The removal of non-aesthetic dermatoses and the reuvelinization of the facial skin with the considered laser effects has a favorable effect on self-esteem and general self-esteem.

The presented conclusion is logical and justifies the conclusions of the dissertation. The therapeutic and aesthetic efficacy of the CO₂ laser shows that it is particularly suitable for the removal of all benign skin lesions in the head and neck area except venectasias and decorative tattoos. Laser ablation, thermolysis and excision are suitable for the removal of unaesthetic dermal melanocyte nevi, papillary nevi and those that are pediculous. They are suitable for multiple, smaller nevi and solar lentigo, for which surgery is unjustified or may be associated with rough scarring and keloids, as well as for multiple lentigin pigmentations of varying intensity on the face, neck, décolleté and shoulders.

Laser ablation is a good alternative for the removal of non-advanced basal cell carcinomas of the face in patients who have refused surgery. It is not suitable in areas at risk of perineural and perivascular advancement - neck and angular area and patients should be convincingly and persistently referred for surgery.

Laser resurfacing is a therapeutic technique for rejuvenating facial skin, which really improves skin texture and elasticity, erases fine and deep wrinkles, corrects acne scars, rough scars caused by trauma, burns, surgery.

The removal of non-aesthetic dermatoses and the reuvelinization of the facial skin with the considered laser effects has a favorable effect on the self-esteem for the appearance and the general self-esteem.

The contributions of the dissertation are significant, with theoretical and applied significance:

Scientific and theoretical contributions:

1. Laser ablation is redefined as thermoradiation self-limiting ablation and is applied as two techniques - Laser Fast Draw Ablation (LFDA) and Single Shot Ablation (OSA). This terminology and techniques, as well as their abbreviations, are introduced and described for the first time here.
2. Laser ablation at 10600 nm is considered not as a non-selective effect, but as a controllable physical process for ablative destruction of bulky pathological lesions with maximum sparing of the underlying and surrounding tissue structures. This control is done with appropriate radiation modulation, selection of optimal energy density, ablative spot size and crawl rate.
3. A new physical model for skin retraction in ablative laser resurfacing is described, due to irreversible structural changes in the triple helix of collagen, explaining the lifting effect.
4. An original contribution is the author's approach to skin pathology and regenerative processes in evolutionary aspect.
5. The understanding of selective laser thermolysis is clarified and revised.

Scientific and applied contributions:

1. The possibility of removal in outpatient conditions of all pathological lesions with only one type of laser (CO2 laser) is demonstrated using optimized techniques for high-speed ablation with high energy density, small focal spot and fast bypass.
2. Techniques are provided for the removal of various non-aesthetic dermatoses in areas at risk of complication using other methods and an effective alternative to some classical approaches.
3. The understanding of the etiology and pathogenesis of acne in evolutionary-anthropogenic aspect is supplemented.
4. A clinically tested new therapeutic approach for non-drug definitive treatment of exacerbated juvenile and adult acne has been developed.
5. A clinical protocol has been created for conducting the procedure for rejuvenation of the facial skin with deep ablative laser resurfacing.
6. A therapeutic plan has been created with an effectively optimized clinical protocol for complete aestheticization and rejuvenation of the facial skin with laser methods. The clinical protocol itself is an innovative contribution to the individual approach to each skin, taking into account its individual characteristics.
7. A practically applicable psycho-therapeutic unilateral protocol is provided, which helps to optimize the communication between doctor and patient in the understanding of the expected end result of the therapy.
8. Psychological work with the patient is introduced to detect accentuation and obsessive-compulsive disorder related to hyperhygienic or pathological actions that sabotage any acne therapy.

IV. CONCLUSION

The dissertation work "OPPORTUNITIES FOR LASER REJUVENATION AND AESTHETICIZATION OF FACIAL SKIN" developed by Dr. Julian Zlatkov Penev covers all scientometric requirements of Law on the development of the academic staff in the Republic of Bulgaria and the Rules for the development of the academic staff in the Medical University "Prof. Dr. P. Stoyanov" - Varna for the award of educational and scientific degree "Doctor". This, as well as the presented scientific production, are grounds for convincingly giving my positive assessment and recommending to the members of the esteemed scientific jury to award the educational and scientific degree "Doctor" to Dr. Julian Zlatkov Penev.

May 2, 2022
Varna

Prepared the opinion:
Prof. P. Troyanova, MD

