

WHITE PAPER
Motus AX
Synchro REPLA:Y



**Moveo Technology. Safety and Efficacy in
Photoepilation Treatment. Our Personal Experience.**



The Code of Excellence

Moveo Technology. Safety and Efficacy in Photoepilation Treatment. Our Personal Experience.

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Abstract

Moveo is the new laser epilation technology from DEKA which for the first time uses an innovative handpiece with a cooled sapphire cylinder tip that conveys the laser beam onto the patient's skin. The use of this sapphire guide drastically reduces system energy leaks to the skin, thus increasing effectiveness of the laser transmission as never before. The system to which the Moveo handpiece is connected can operate at high frequencies and reduced fluences. The result is that the laser energy (from an alexandrite or Nd:YAG source) can be passed repeatedly over the same area. This makes the treatment extremely safe, painless and allows for a uniform treatment. With Moveo, epilation is therefore extremely simple, safe, fast, without undesirable side effects and virtually painless for the patient.

Description

The effectiveness of alexandrite and Nd:YAG laser sources is scientifically and clinically recognized for photoepilation^[1-4]. However, this type of treatment is not completely problem free due to the mode of laser energy emission. The platforms currently on the market can produce side effects, albeit transient ones, and cause discomfort because of the pain induced. For this reason, if not sufficiently motivated, patients often discontinue treatment. To ensure thermal follicular damage at each individual laser emission, these conventional systems - with traditional handpieces and cutaneous spacers - produce single pulsed emissions with maximum operating frequency of 2-3 Hz and rather high fluences. The quest for therapeutic efficacy often makes this kind of treatment painful or at the very least unpleasant for many patients^[5-6]. Furthermore, selecting the correct protocol to guarantee both efficacy and safety requires a certain degree of experience.

To understand the importance of the innovation introduced by the Moveo technology, a brief introduction is required. In general it can be said that, during a laser hair removal session, treatment time is inversely proportional to the power of the laser used. In other words, the higher the laser power and the shorter the treatment time. The power, which is the product of pulse energy and frequency, can be emitted in two ways: a) with high energy, low frequency pulses or b) with lower energy, higher frequency pulses. To date, the systems on the market have preferred the first solution with high energy - in the order of tens of Joules - spread out over a large spot size - around 20 mm.

This method is very rapid, but can be painful and is not devoid of side effects, particularly when the competition between the melanin in the hairs and skin is significant as is the case for darker phototypes.

Another important issue is related to the optical characteristics of the skin which can cause reflection thus significant laser pulse energy losses. This effect stems from the significant differences between refractive index of the air - through which the laser beam must pass before reaching the skin - and that of the skin itself^[7-8]. The innovation DEKA now offers for photoepilation is the new handpiece with Moveo technology (figure 1) which decreases the two issues mentioned above.



Figure 1. The Moveo handpiece has a built-in skin contact cooling system. The sapphire tip is cooled to 15°C for maximum patient comfort.

It is a device with cooled sapphire cylinder tip. This material was chosen because it can carry all the laser energy emitted by the system to the skin, thus reducing the above-mentioned reflection losses. The graph in (figure 2) shows skin reflectivity in response

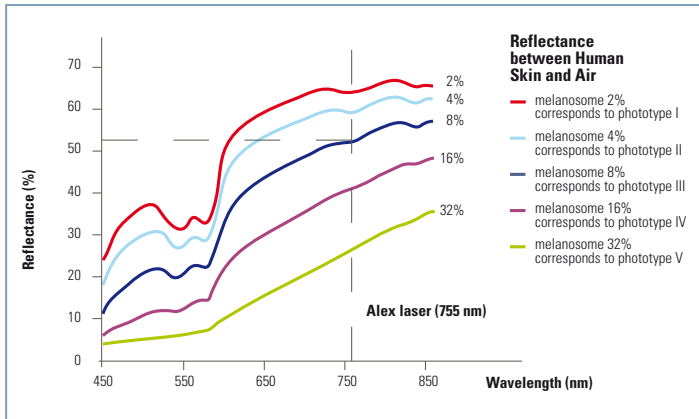


Figure 2. Modeled skin reflectance for different melanosome levels.

to changes in wavelength and melanin content. At 755 nm (wavelength of the alexandrite laser), with a melanin content of 8% (corresponding to phototype II), the percentage reflection is over 50%. This means that a very significant fraction of the energy is lost during treatment hence cannot be harnessed for therapeutic purposes. This loss is caused by the high variation between the refractive index of the skin and the overlying air.

The Moveo handpiece has been designed to overcome this drawback. DEKA has developed a technology that optimizes the laser-skin effect, practically doubling energy transmission and for this reason significantly increasing energy efficiency. The fact that the sapphire tip is in direct contact with the skin reduces this variation in refractive index, thus reduces reflected energy losses.

Other advantages of the sapphire tip compared with other solutions are that it does not deteriorate and hair residues do not become attached during treatment. With circular or linear movements, the operator slides the cooled handpiece over the patient's skin, covering an area approximately the size of the palm of a hand (10 cm x 10 cm). By passing over the same area several times, the temperature of the follicle is progressively increased until it reaches the thermal damage threshold. This mode of operation, which employs higher frequencies and lower fluences, brings with it a great advantage: it eliminates any type of discomfort for the patient.

Moveo handpiece is available for the Synchro REPLA:Y platform (Premium and Excellium models) and can use either of the system's laser sources: alexandrite or Nd:YAG. It can also be used on the new alexandrite Motus AX laser system.

With Synchro REPLA:Y the treatment can be customized according to the patient's hair and skin type: the alexandrite source is best for clear skin types, Nd:YAG for darker skin types. However, although the alexandrite is normally preferable for fair-skinned subjects, with the new Moveo technology, this wavelength can also be safely used with darker skin types, without causing undesirable hypopigmentation and always ensuring utmost patient comfort.

Even the choice of parameters is extremely simple. In fact, the operator must choose:

- 1. fluence** - within the 2 - 8 J / cm² range - for alexandrite and Nd:YAG sources;
- 2. pulse type** - from one of 3 different types (SOFT, with long 8 ms pulse time more suitable for thick, dark hairs; MEDIUM; HIGH, with short 3 ms pulse time more suitable for thin, light hairs);
- 3. frequency**, typically 5 Hz;
- amount of **energy** to be dispensed over a surface that, by convention, is set at 10 cm x 10 cm. The normal setting is 2000-2500 J. The energy can be increased, for instance when we want to treat a wider area, or reduced for dark skin phototype. Likewise, the amount of energy to be dispensed is the treatment end-point.

Advantages

Moveo technology offers many advantages over the conventional method. Treatment is:

- painless, and therefore well tolerated (with its effective built-in cooling, an external cooler is not required);
- fast;
- extremely simple to perform, even by less experienced operators;
- practically free of side effects, e.g. hypopigmentation;
- more uniform, hence avoiding the formation of "islands" of untreated hair.

How To Perform Treatment

The skin should be clean and the hairs preferably 1-2 mm long (the patient can shave at home a few days

before the session, or a trimmer can be used). A thin layer of transparent ultrasound gel or colourless oil, like that supplied by DEKA, is applied on the skin.

Then the parameters are selected according to hair type and colour, area to be treated and the patient's skin type. At this point, the sapphire cylinder is set in direct contact with the patient's skin and moved, sliding over a linear or circular path. It is important to cover a surface of about 100 cm² and continue treating the same area, passing over it repeatedly until the previously selected amount of energy is reached.

Once the set Joule measurement has been reached, laser emission stops. It is then possible to move on to treat the adjacent area, using the same technique. Once the treatment has been completed, simply remove the gel or oil. Neither antibiotic cream nor ointment is required.

When treatment end-point is reached, the system simply emits a beep as the previously set energy supply is cut off. There is no need to look for classic perifollicular oedema, which is not always evident. Sometimes it is possible to see slight erythema which is resolved within a few minutes.

Over the 3-4 days following treatment, the hairs that were shaved at the time of the session, will begin to grow back although this does not cause the unpleasant itchiness typically felt after shaving (especially in the groin area). They will start to fall out approximately 15-20 days later and this will continue for a similar number of days until an estimated 40-80% of the hairs are eliminated (at the first session). Even if the results are remarkable from the very first session, in the early stages, more frequent treatments - approximately once every month and a half - are advisable. Later, sessions may be spread out over time and, after the main treatment cycle, 1-2 yearly maintenance sessions are recommended.

Clinical Experience

We conducted a clinical experience involving 40 patients of both sexes. Both laser sources were used, although, in most cases, the alexandrite was preferred over Nd:YAG. In particular, the latter was used in epilation of an African-American patient and during the summer when patients came in with a tan.

In all these cases, Moveo proved an effective device, easy to use and free of any side effects. Only minor discomfort was felt during treatment of the groin and underarm areas. To prevent such unpleasantness, in these more sensitive areas, a gel was applied rather

than oil, since use of an external cooler would have dried out the oil too quickly, hindering sliding of the handpiece.

Hair fell out within 15-20 days of treatment, together with a significant reduction in the thickness of hair and a dramatic delay in-re-growth.

CASE 1: patient (phototype 3) with heavy hair in the groin area and folliculitis subsequent to waxing. The patient underwent initial treatment with Moveo in May 2015.

During the first session, we shaved the treatment area and selected the parameters:

- Moveo with alexandrite source;
- Fluence: 7 J/cm²;
- Pulse: SOFT;
- Total energy emitted: 2000 J.

A transparent gel was applied on the patient's skin and then, with linear movements, a small square area (<100 cm²) was delimited and the zone within the square treated with repeated passes. Once the set Joule level was reached (setting: 2000 J), treatment moved on to the adjacent areas, and so on. A second, faster pass was also performed over the entire area.

Particular attention was paid to the area next to the tattoo. In fact, during the first session, that area was not treated. One and a half months after treatment, a dramatic reduction was seen in hair quantity and thickness along with a dense island of thicker hair in the area where treatment with Moveo had not been performed.

The next two sessions were scheduled 1 and a half months apart. On those occasions, given the safety of the device, the area around the tattoo was also treated.



Figure 3. Case 1. Before treatment.



Figure 4. Case 1. One and a half months after the first treatment session. Note that an island of dense, thick hairs had regrown in the area where, to preserve the tattoo, treatment had not been performed. The other areas show sporadic regrowth of thin hairs.



Figure 5. Case 1. Three months after the second session (this time a complete session) the patient returned hair free.

CASE 2: Patient of African-American origin (phototype V) who came under observation for numerous facial hairs. The patient reported that the situation had worsened following previous laser treatments. Given that this patient had dark skin, we choose to use the Moveo with a Nd:YAG source.

The following parameters were as follows:

- Fluence: 3-5 J/cm² (3 J/cm² was selected for the first session while this was increased to 5 J/cm² in subsequent sessions);
- Pulse: SOFT;
- Total energy emitted: 2000 J.

As in the previous case, a small area was treated until the system accumulator energy setting was reached, and then treated neighbouring areas in the same way. Again in this case, a month and a half later, the

hairs were much finer and regrowth had slowed. In subsequent sessions, performed 1 month and a half/two months apart, a significant hair reduction was seen. At the present time, the patient has undergone 4 sessions with Moveo Nd:YAG.



Figure 6. Case 2. Before treatment (24 April 2015).



Figure 7. Case 2. One and a half months after the first treatment (12 June).



Figure 8. Case 2. One and a half months after the second treatment (4 September).



Figure 9. Case 2. One and a half months after the third treatment (26 October 2015).

CASE 3: Patient (phototype III) with normal hair at the groin level. Given that this patient had a very low pain threshold, the choice went to the Moveo alexandrite

with the aid of an external cooler to prevent any patient discomfort.

In this case, however, we tested much higher parameters in order to evaluate device tolerability, particularly in a very sensitive patient.

The parameters were as follows:

- Fluence: 8 J/cm²;
- Pulse: NORMAL;
- Total energy emitted: 3000 J.

The patient felt a little heat, but did not need to interrupt treatment. Two sessions were performed, the first in June and the second at the end of July. The patient returned in December (after 5 months) for a third session. However, the follow-up at 5 months revealed that the results in terms of reduction in hair quantity and thickness and delayed regrowth had been maintained.



Figure 10. Case 3. Before treatment, June 2015.



Figure 11. Case 3. After two treatment sessions, follow-up at 5 months.

Conclusion

The above-mentioned cases show that this device is particularly selective for melanin and for this reason effective in photoepilation.

However, unlike conventional methods, Moveo technology - characterized by high energy transmission to the skin achieved through the use of sapphire tip, high frequency, reduced fluence emissions and repeated passage over a given treatment area - offers excellent results in terms of efficacy (reduction in the number of hairs), while remaining a safe, easy, manageable treatment, even for inexperienced operators. Moreover, it is well tolerated by patients (as it is essentially painless) and presents no side effects. In addition, the technique - which permits multiple passes over the same area - ensures extremely uniform treatment.

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