

Non-Surgical Medical Aesthetic Treatment Algorithm for General Practitioners in Malaysia

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Abstract

The aesthetic patient is different from medical patients in many ways. From patient history taking, assessment and treatment method depends on several factors. Initially, USBC (Ungku Shahrin Beauty Concept) explained how we could assess aesthetic patient structurally. Moving forward, USATA (Ungku Shahrin Aesthetic Treatment Algorithm) will enlighten medical aesthetic practitioners on how to treat aesthetic patients in a well-organized manner. With varieties of treatment modalities offered in this field, it is paramount for medical aesthetic practitioners to choose the right treatment for suitable patients and use the right devices. Among factors need to be considered, such as skin type, psychological motivation, financial support, regulation issues, etc. This article will give an overview of the aesthetic patient treatment algorithm, especially for Malaysian medical aesthetic practitioners.

Keywords:

Aesthetic Medical Practice, Aesthetic Medicine, Aesthetic Treatment Algorithm, Non-Surgical, Minimally Invasive Treatment, Non-Invasive Treatment

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People generally believe that more attractive people are more competent, likeable, and, in general, "better" than less attractive people: a "beauty-is-good" stereotype. Those physically or facially attractive appear to foster positive expectations and impressions and gain various interpersonal advantages (Alley & Hildebrandt, 1988). Patients frequently wish for more significant overall improvement, anticipating a more cheerful, relaxed, or less tired appearance following treatment (de Maio, 2021). The ability to differentiate between patient complaints and requests are crucial. One is clinically presented, i.e., pigmentary disorder, acne, cellulite, and the latter is to satisfy the patient's goals, i.e., increase the nasal bridge height, thicker lip. They may also present with both complaints and requests at the same time. There are difficulties in prescribing a standard treatment algorithm by medical aesthetic practitioners. It is influenced by the aetiology, underlying medical or psychiatric comorbidities (hypochondriac, body dysmorphic syndrome), availability of treatment, practitioners' skills, patient financial capabilities and complications from treatment. External factors such as specific regulations of the country governing bodies, insurance coverage and medical indemnity need consideration.

There have been no well-designed clinical trials examining the pan facial (i.e., global) approach to aesthetic treatment that employs a combination of treatment modalities (Kalashnikova et al., 2021). Although individualized combination therapy impacts modern aesthetic practice—in 2014, nearly half of all cosmetic patients in the United States seeking noninvasive or minimally invasive interventions received multiple cosmetic procedures at the same time. There are no guidelines for a combination approach that have been published (Carruthers et al., 2016). Most aesthetic treatment algorithms or approaches are being segmented into different parts, such as facial areas or bodies, and mostly, they are limited to specific treatment modalities. A previous study by de Maio M (2021) on the

methodological approach to facial aesthetic treatment only suggested the usage of injectables hyaluronic acid (HA) dermal fillers. Another study by (Narurkar et al., 2016) provide helpful guidance for a multimodal approach to facial aesthetic treatment; however, this study focusses on subjects who received onabotulinum toxin A for glabellar lines and crow's feet lines, and dermal fillers for nasolabial folds, oral commissures, marionette lines, perioral lines, or radial cheek lines.

In Malaysia, the treatment modalities are divided into three categories, i.e., Noninvasive, minimally invasive and invasive, whereby noninvasive and minimally invasive are considered non-surgical medical aesthetic procedures (Aesthetic Medical Practice Guidelines MOH Malaysia, 2013). However, the guidelines do not provide any treatment algorithm to Malaysian medical aesthetic practitioners, leaving the practitioners with a myriad of treatment options without a standardized treatment approach. This article aims to suggest the best and effective medical aesthetic treatment algorithm using allowable non-surgical treatment modalities by the Ministry of Health, Malaysia.

Areas covered

Consideration in the treatment algorithm

1. Underlying medical illness and conservative treatment approach

Like other medical fields, history taking, clinical assessment and investigation are crucial in aesthetic medical practice. In utilizing the algorithm, practitioners must eliminate any underlying diseases that may portray as an aesthetic concern. For example, excessive facial hair could be due to untreated polycystic ovarian syndrome, and melanoma can easily be misdiagnosed with Nevus of Ito. According to a retrospective study conducted at the University Hospital of Zurich in 2010, a misdiagnosed pigmentary lesion can cause the possibility of

melanoma induction by laser treatment. Based on the observations, together with published information, biologically relevant delay in melanoma diagnosis due to laser treatment may retard appropriate staging and therapy (Zipser et al., 2010). It is vital to start the treatment conservatively before moving to more advanced medical aesthetic modalities.

2. Aesthetic patient assessment concept

Treatment options in medical aesthetics are often based on meticulous judgement by the practitioners after considering patients complaints and requests. The treatment algorithm approach in this article is based on Ungku Shahrin Beauty Concept (USBC)TM aesthetic

patient assessment. According to USBC, beauty can be divided into two major components: face and body beauty. Both categories are subdivided into complexion and structure (Mohd Shahrin U, 2020). For example, the perfect complexion for face beauty is those without pimples/acne or blemishes due to pigmentary disorder.

On the other hand, idyllic structural face beauty is when your face nicely contours according to the liking of the patient (i.e., oval shape, high nasal bridge, double eyelid). Like body beauty, the complexion element should not have a stretch mark, striae, or noticeable scar. For body structure, it would be preferably shaped (i.e., Waist and Hip ratio < 0.85 for males and 0.75 for females) (Mohd Shahrin U, 2020) (fig. 1).

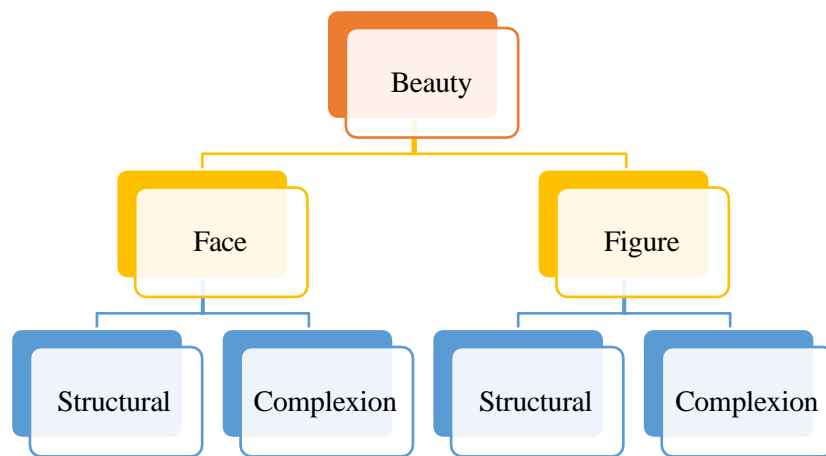


Figure 1: Ungku Shahrin Beauty Concept (USBC)

3. In accordance with Malaysia Aesthetic Medical Practice Guidelines

There have been allegations of severe consequences such as deformity and even death in Malaysia due to cosmetic operations performed by unskilled medical and non-medical practitioners. Because safety is of the utmost significance, this activity must be controlled by developing a set of current and appropriate rules. A guideline was created by gathering expert views from many stakeholders in the Ministry of Health, universities, professional organisations, and private practice. It would serve as the national aesthetic medical practice guidelines for

general practitioners, medical specialists, and surgical specialists (Aesthetic Medical Practice Guidelines MOH Malaysia, 2013). Even though there is a vast option for non-surgical medical aesthetic treatment globally, the development of this algorithm is only based on medical aesthetic procedures approved by the Ministry of Health Malaysia.

4. All patients are assumed to be in a healthy mental state

Numerous studies have been conducted to investigate the psychological functioning of cosmetic surgery patients. Sarwer and colleagues have suggested that these studies were

designed with two primary goals in mind: (1) to identify psychological characteristics or traits that would contraindicate cosmetic surgery and (2) to assess postoperative psychological changes (Fedok et al., 2003). A study by Crerand et al. shows that 7% to 15% of people appearing for aesthetic procedures may have Body Dysmorphic Disorder (BDD) (Crerand et al., 2006). To obtain better outcomes in individuals undergoing cosmetic surgery with psychiatric problems, it is helpful to prioritise psychiatric care first rather than going straight for surgical treatment. Preoperative mental assessment should be standard practice in cosmetic surgery (Kazuhiro Hayashi, 2007). This algorithm is applicable for the patient with normal psychology and psychiatric mental status.

5. Well trained and certified medical aesthetic practitioners

There is a need for the medical profession to adopt guiding principles for the practice of aesthetic medicine. The best method is undoubtedly evidence-based practice. Before conducting any treatment on a patient, doctors must ensure that they are competent and sufficiently trained. He or she should stay current on medical information and maintain clinical and technical skills (Goh, 2009). Aesthetic medicine emphasises form and function, and both learning and practising medicine involves formal and content elements (Bleakley et al., 2006). In Malaysia, any doctor who wishes to embark in this field must have a Letter of Credentialing and Privileging (LCP) for the aesthetic procedure(s) he/she intends to perform. Upon recommendation by the Main Credentialing and Privileging Committee of Aesthetic Medical Practice, the LCP shall be issued to the doctors by the Medical Practice Division, Ministry of Health Malaysia. With the LCP, they are eligible for registration with the National Registry of Registered Medical Practitioners Practicing Aesthetic Medical Practice (Aesthetic Medical Practice Guidelines MOH Malaysia, 2013).

6. Scientific approach

Research conducted in 1985 shows that only 15% of physician judgments were based on data from verified clinical trials. This disparity prompted the notion of formally approving EBM and teaching physicians how to utilise it—that is, how to participate in "the conscious, explicit, and prudent use of current best evidence in making choices regarding the care of individual patients" (Nahai, 2011). Although the aesthetic medical practice has not been recognised as a medical speciality in Malaysia, it is scientific in its approach and practice (Aesthetic Medical Practice Guidelines MOH Malaysia, 2013). In preparing the algorithm, references are made from various journals and aesthetic medicine related books to ensure it aligns with evidence-based medicine.

7. Marketing hype and baseless claims by the manufacturer

It is well known that an established manufacturer will spend up to 60% of their annual budget on marketing, and they are not afraid to use every available platform to creatively promote their product, such as magazines, television, social media platform, billboard. Sadly, few decent manufacturers can back it up with scientific evidence (Mohd Shahrin U, 2020). This algorithm will only use the generic term in describing treatment modalities and refrain from proposing baseless, non-scientific treatment claims.

Medical aesthetic treatment algorithm

The spectrum of facial aesthetics is constantly evolving as we better understand facial anatomy and discover new and refined applications for various aesthetic tools, thus acknowledging that combination treatments are necessary to address aesthetic concerns (Fabi et al., 2017). Apart from all the considerations discussed earlier, the algorithm is not limited to a single approach modality. Practitioners can perform multiple treatment approaches to achieve patients' goals according to their sound judgement.

A) Face area - Structural

While most of the structural improvements for facial structure are suitable for surgical intervention, the non-surgical treatment approach can help achieve structural improvement with

realistic expectations. Restricted with the Malaysia Aesthetic Medical Practice Guidelines, treatment modalities are limited to the application of Botulinum toxin, dermal fillers, Radiofrequency (RF) and High-Intensity Focus Ultrasound (HIFU) (*tab. 1*).

Table 1: Medical Aesthetic Treatment Algorithm for Face Structure

Complaints / Requests	Treatment Options	Notes
1. Overdeveloped masseter muscle, Achieve V-Shape jawline	BTA injection	<i>Injecting masseter muscle to relax and eventually reduce muscle size and give the slimmer jawline shape (Chan et al., 2019), (Kwon et al., 2019).</i>
2. Deep tear trough, hollow cheek/temple, concave forehead, NFL / Marionette line, scar, thin lips, "static" rhytids	Dermal Fillers, i.e., HA fillers, depending on the viscosity and concentration	<i>To "fill-up" depleting soft tissue, typically at dermal, subdermal layer or supra-ostium with a clinical tightening impact on the dermis (Percec et al., 2020).</i>
3. Enhance Chin length, nasal bridge/nasal tip, thicker lips/enhance vermilion line, philtrum	Dermal Fillers, i.e., HA fillers, depending on the viscosity and concentration	<i>Volumizing using dermal fillers according to requirement and suggestion. The safest method may be to use a large diameter cannula and inject the filler into the pre-periosteal layer with a careful approach (Lee et al., 2019).</i>
4. "Dynamic" rhytids (forehead, crow feet, glabellar, bunny line)	BTA injection on specific facial muscles, e.g., Orbicularis Oculi, Frontalis, Corrugator etc.)	<i>BTA reduce expression muscles contraction capabilities that produce the "dynamic" rhytids It is a safe and effective therapy that temporarily improves face wrinkles and dynamic rhytids in specific anatomic areas (Niamtu, 2003).</i>
5. Droopy Brow/Eye	BTA injection on suprolateral portion of Orbicularis Oculi muscle	<i>Applications of 6U BTX-A to the superolateral portion of orbicularis oculi provide brow elevation and increased interpalpebral distance and upper eyelid distance (Uygur et al., 2013)</i>
	Periorbital RF treatment	<i>RF will produce new collagen to give the lifting effect for loose skin around eye area with a statistically significant increase in the mean of collagen types I and III, as well as freshly produced collagen, compared to the baseline (El-Domyati et al., 2011).</i>
6. "Chubby" face, Double Chin	HIFU	<i>HIFU target the subdermal fat layer to lipolyse adipose tissue. This is due to cavitation bubbles that increase in size and oscillate until they finally collapse (Mohd Shahrin U, 2019).</i>
7. Eye bags	RF or HIFU	<i>HIFU penetration depth should be below 1.5mm to target superficial skin layer (Mohd Shahrin U, 2019). RF will only</i>

		<i>target superficial skin and promote neo-collagenases (Rousseaux, 2015).</i>
8. Jowl / loose facial skin	RF or HIFU	<i>HIFU and RF with specific thermal injury zone (TIZ) will initiate wound healing process that eventually promote neo-collagenases (Mohd Shahrin U, 2019; Rousseaux, 2015)</i>
	Fractional Laser, e.g., CO2, Erbium Yag	<i>Non-ablative laser creating a micro-column wound, promoting neo-collagenases (Preissig et al., 2012).</i>
	Long pulse laser, e.g., Nd Yag, Alexandrite	<i>Longer pulse duration cause heat generation to coagulate the dermal layer, promote neo-collagenases (Polnikorn et al., 2016).</i>

B) Face area- Complexion

Most non-surgical medical aesthetic treatment focuses on skin complexion complaints or requests such as pigmentary disorder, vascular lesion, acne lesion etc. Understanding patient skin colour, aetiology, physics principles, mechanism of action, endpoint and biological

changes of the aesthetic problem are essential to ensure safe and effective treatment. The application of the face complexion treatment algorithm should be supported by rigorous training and experience in performing the procedures (*tab. 2*).

Table 2: Medical Aesthetic Treatment Algorithm for Face Complexion

Complaints /Requests	Treatment Options	Notes
1. Epidermal pigmentary disorder: Lentigines, Ephelides, Café au lait, Seborrheic keratoses etc.	Skin type I – III: Argon (488nm), Ruby (694nm), Alexandrite (755nm), *KTP (532nm)	<i>Choose a shorter wavelength with a higher affinity to melanin (Anderson et al., 1989; Welch et al., 1989). *Use cautiously due to competing chromophores</i>
	Skin type IV – V: Nd Yag (1064nm), Diode (810nm)	
	Superficial and Medium Chemical Peels: AHA, BHA peels with suitable concentration and pH	<i>Inhibit melanin production, exfoliate superficial skin (Ds et al., 2009).</i>
2. Dermal/Mixed pigmentary disorder: Melanocytic nevi, Nevus of Ota, Hori's nevus, Melasma, PIH, Tattoo etc.	Skin type I – III: Alexandrite (755nm)	<i>Choose longer wavelength for deeper penetration with affinity to melanin. (Kim et al., 2016; Polnikorn et al., 2016; Sarkar et al., 2012)</i>
	Skin type IV – V: Nd Yag (1064nm), Diode (810nm)	
	Superficial and Medium Chemical Peels: AHA, BHA peels with suitable concentration and pH	<i>Inhibit melanin production, exfoliate superficial skin. Deeper peels yielding more dramatic outcomes but with a higher risk of complications (Nikalji et al., 2012).</i>
3. Vascular lesion: Hemangiomas, Port Wine Stain, Telangiectasis etc.	KTP (532nm), Pulse Dye (585nm), Alexandrite (755nm), Nd Yag (1064nm)	<i>Longer pulsed duration to dissipate heat to vessel wall. Use laser with multi pulses with delay time > epidermal TRT</i>

		<i>(Ims) for darker skin (Adamič et al., 2015; Kumaresan & Srinivas, 2011; Wall, 2007)</i>
	IPL	<i>Use >700nm filter, IPL suitable for vascular lesion treatment due to the long pulse nature of the device (Angermeier, 1999; Kalil et al., 2017)</i>
4. Acne	IPL	<i>Reduce sebum production and inflammation, destroy P.Acnes (Hi et al., 2021)</i>
	Superficial and Medium Chemical Peels: AHA, BHA peels with suitable concentration and pH	<i>Reduce sebum production and inflammation (Castillo & Keri, 2018)</i>
	Laser, e.g., Nd Yag (1064nm)	<i>Using long pulse duration laser to reduce sebum production and inflammation (Mohd Shahrin, 2019)</i>
5. Large pores, Scar, Acne Scar	Superficial and Medium Chemical Peels: e.g., AHA, BHA peels with suitable concentration and pH	<i>Exfoliate epidermal/dermal layer, promote collagen production (Ds et al., 2009; Nikalji et al., 2012)</i>
	Fractional laser, e.g., CO2, Erbium Yag	<i>Non-ablative laser removing epidermal layer for neo-collagenases (Kang et al., 2009)</i>
6. Hair removal	Long pulsed laser, e.g., Nd Yag	<i>Long pulse duration ensure heat destroy hair stem cell (Alster et al., 2001; Welch et al., 1989)</i>
	IPL	<i>Use >700nm filter, Suitable for hair removal due to the long pulse nature of the device (Babilas et al., 2010; Dieter Manstein, Mehran Pourshagh & Altshuler, R. Rox Anderson Ilya Yaroslavsky, n.d.; Goldberg, 2012)</i>
7. Rejuvenation	Superficial and Medium Chemical Peels: e.g., AHA, BHA peels with suitable concentration and pH	<i>Exfoliate epidermal/dermal layer, promote collagen production (Ds et al., 2009; Nikalji et al., 2012)</i>
	Microdermabrasion	<i>Exfoliate stratum corneum, hasten skin cycle (Karimipour et al., 2010)</i>
	Fractional laser, e.g., CO2, Erbium Yag	<i>Non-ablative laser removing epidermal layer for neo-collagenases (Lecocq et al., 2013; Preissig et al., 2012)</i>

C) Body area- Structure

Body structure treatments are the least available in this algorithm. Even though the manufacturer

made several attempts, they have the least scientific evidence to justify their claims. Treatment modalities only focused on Radiofrequency (RF), High-Intensity Focus

Ultrasound (HIFU) and fat freezing technologies (*tab. 3*).

Table 3: Medical Aesthetic Treatment Algorithm for Body Structure

Complaints /Requests	Treatment Options	Notes
1. Localise fat	HIFU	<i>HIFU can target the subcutaneous fat layer causing the lysis of adipose cells</i> (Jewell et al., 2012; Shek et al., 2009; SousH et al., n.d.) .
	Fat Freezing	<i>Freezing the pocket of the fat layer can cause apoptosis of the adipose cells</i> (Avram & Harry, 2009; Putra et al., 2019).
2. Skin redundancy, Loose skin	RF or HIFU	<i>Tighten superficial skin, promote neo-collagenases</i> (Access, 2002; Slayton & Gliklich, 2007)

D) Body area- Complexion

Similar to face complexion, complaints and requests by the patients commonly on the pigmentary disorder, vascular lesion, acne of

their body, scar, unwanted tattoo, striae and stretchmark. Body hair removal also becoming popular with the introduction of a long-pulsed laser to the market (*tab. 4*).

Table 4: Medical Aesthetic Treatment Algorithm for Body Complexion

Complaints /Requests	Treatment Options	Notes
1. Epidermal pigmentary disorder: Lentigines, Seborrheic keratoses etc.	Skin type I – III: Argon (488nm), Ruby (694nm), Alexandrite (755nm), *KTP (532nm). Skin type IV – V: Nd Yag (1064nm), Diode (810nm)	<i>Choose a shorter wavelength with a higher affinity to melanin</i> (Anderson et al., 1989; Welch et al., 1989). <i>*Use cautiously due to competing chromophores</i>
	Superficial and Medium Chemical Peels: AHA, BHA peels with suitable pH	<i>Inhibit melanin production, exfoliate superficial skin</i> (Ds et al., 2009).
2. Dermal/Mixed pigmentary disorder: Melanocytic nevi, PIH, Tattoo etc.	Skin type I – III: Alexandrite (755nm) Skin type IV – V: Nd Yag (1064nm), Diode (810nm)	<i>Choose longer wavelength for deeper penetration with affinity to melanin.</i> (Kim et al., 2016; Polnikorn et al., 2016; Sarkar et al., 2012)
	Superficial and Medium Chemical Peels: AHA, BHA peels with suitable concentration and pH	<i>Inhibit melanin production, exfoliate superficial skin. Deeper peels yielding more dramatic outcomes but with a higher risk of complications</i> (Nikalji et al., 2012).
3. Vascular lesion: Hemangiomas, Telangiectasis etc.	KTP (532nm), Pulse Dye (585nm), Alexandrite (755nm), Nd Yag (1064nm)	<i>Longer pulsed duration to dissipate heat to vessel wall. Use laser with multi pulses with delay time > epidermal TRT (1ms) for darker skin</i> (Adamič et al., 2015; Kumaresan & Srinivas, 2011; Wall, 2007)

	IPL	<i>Use >700nm filter, IPL suitable for vascular lesion treatment due to the long pulse nature of the device (Angermeier, 1999; Kalil et al., 2017)</i>
4. Acne	IPL	<i>Reduce sebum production and inflammation, destroy P.Acnes (Hi et al., 2021)</i>
	Superficial and Medium Chemical Peels: AHA, BHA peels with suitable concentration and pH	<i>Reduce sebum production and inflammation (Castillo & Keri, 2018)</i>
	Laser, e.g., Nd Yag (1064nm)	<i>Using long pulse duration laser to reduce sebum production and inflammation (Mohd Shahrin, 2019)</i>
5. Scar, Stretchmark	Superficial and Medium Chemical Peels: e.g., AHA, BHA peels with suitable concentration and pH	<i>Exfoliate epidermal/dermal layer, promote collagen production (Ds et al., 2009; Nikalji et al., 2012)</i>
	Fractional laser, e.g., CO2, Erbium Yag	<i>Non-ablative laser removing epidermal layer for neo-collagenases (Kang et al., 2009)</i>
6. Hair removal	Long pulsed laser, e.g., Nd Yag	<i>Long pulse duration ensure heat destroy hair stem cell (Alster et al., 2001; Welch et al., 1989)</i>
	IPL	<i>Use >700nm filter, Suitable for hair removal due to the long pulse nature of the device (Babilas et al., 2010; Dieter Manstein, Mehran Pourshagh & Altshuler, R. Rox Anderson1 Ilya Yaroslavsky, n.d.; Goldberg, 2012)</i>

Conclusion

Developing a treatment algorithm is a rigorous task, especially when the aesthetic medical field evolves significantly. Challenges lie in various factors (not limited to) such as patients' unrealistic complaints or requests, regulation restriction, beauty trend, marketing hype, treatment availability, and practitioners' capabilities. This algorithm will cover all aspects of allowable treatment modalities by Malaysian governing bodies and hopefully can become a guide to all general practitioners who provide

aesthetic medical services in their clinics. However, in the future, more treatment options can be included to have a holistic approach to treating patients for Malaysian and throughout the world.

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References

1. Access, F. (2002). *Technical characterization of an ultrasound source for noninvasive thermoablation by high - intensity focused ultrasound*. 90(3).
2. Adamič, M., Pavlovic, M. D., Troilius Rubin, A., Palmetun-Ekbäck, M., & Boixeda, P. (2015). Guidelines of care for vascular lasers and intense pulse light sources from the European Society for Laser Dermatology. *Journal of the European Academy of Dermatology and Venereology*, 29(9), 1661–1678. <https://doi.org/10.1111/jdv.13177>
3. Aesthetic Medical Practice Guidelines MOH Malaysia. (2013). GUIDELINES ON AESTHETIC MEDICAL PRACTICE FOR REGISTERED MEDICAL PRACTITIONERS. In *Aesthetic Medical Practice Division, KKM, Malaysia* (Vol. 1, p. 8). KKM, Malaysia. <https://www.moh.gov.my/moh/images/gallery/Garispanduan/GUIDELINES%20ON%20AESTHETIC%20MEDICAL%20PRACTICE%20FOR%20REGISTERED%20MEDICAL%20PRACTITIONERS.pdf>
4. Alley, T. R., & Hildebrandt, K. A. (1988). Determinants and Consequences of Facial Aesthetics. In *Social and Applied Aspect of Preceiving Faces* (pp. 101–140).
5. Alster, T. S., Bryan, H., & Williams, C. M. (2001). Long-pulsed Nd:YAG laser-assisted hair removal in pigmented skin: a clinical and histological evaluation. *Arch Dermatol*, 137(7), 885–889. 11453807
6. Anderson, R. R., Margolis, R. J., Watanabe, S., Flotte, T., Hruza, G. J., & Dover, J. S. (1989). Selective Photothermolysis of Cutaneous Pigmentation by Q-switched Nd: YAG Laser Pulses at 1064, 532. and 355nm. *Journal of Investigative Dermatology*, 93(1), 28–32. <https://doi.org/10.1111/1523-1747.ep12277339>
7. Angermeier, M. C. (1999). *Treatment of facial vascular lesions with intense pulsed light*. 95–100.
8. Avram, M. M., & Harry, R. S. (2009). Cryolipolysis™ for subcutaneous fat layer reduction. In *Lasers in Surgery and Medicine* (Vol. 41, Issue 10, pp. 703–708). <https://doi.org/10.1002/lsm.20864>
9. Babilas, P., Schreml, S., Szeimies, R. M., & Landthaler, M. (2010). Intense pulsed light (IPL): A review. *Lasers in Surgery and Medicine*, 42(2), 93–104. <https://doi.org/10.1002/lsm.20877>
10. Bleakley, A., Marshall, R., & Brömer, R. (2006). Toward an aesthetic medicine: Developing a core medical humanities undergraduate curriculum. *Journal of Medical Humanities*, 27(4), 197–213. <https://doi.org/10.1007/s10912-006-9018-5>
11. Carruthers, J., Burgess, C., Day, D., Fabi, S. G., Goldie, K., Kerscher, M., Nikolis, A., Pavicic, T., Rho, N. K., Rzany, B., Sattler, G., Sattler, S., Seo, K., Werschler, W. P., & Carruthers, A. (2016). Consensus recommendations for combined aesthetic interventions in the face using botulinum toxin, fillers, and energy-based devices. *Dermatologic Surgery*, 42(5), 586–597. <https://doi.org/10.1097/DSS.0000000000000754>
12. Castillo, D. E., & Keri, J. E. (2018). Chemical peels in the treatment of acne: Patient selection and perspectives. *Clinical, Cosmetic and Investigational Dermatology*, 11, 365–372. <https://doi.org/10.2147/CCID.S137788>
13. Chan, I. L., Cohen, S., da Cunha, M. G., & Maluf, L. C. (2019). Characteristics and management of Asian skin. In *International Journal of Dermatology* (Vol. 58, Issue 2, pp. 131–143). Blackwell Publishing Ltd. <https://doi.org/10.1111/ijd.14153>
14. Crerand, C. E., Franklin, M. E., & Sarwer, D. B. (2006). Body dysmorphic disorder and cosmetic surgery. In *Plastic and Reconstructive Surgery* (Vol. 118, Issue 7). <https://doi.org/10.1097/01.prs.0000242500.28431.24>
15. de Maio, M. (2021). MD Codes™: A Methodological Approach to Facial Aesthetic Treatment with Injectable Hyaluronic Acid Fillers. *Aesthetic Plastic Surgery*, 45(2), 690–709. <https://doi.org/10.1007/s00266-020-01762-7>
16. Dieter Manstein, Mehran Pourshagh, A. V. E., & Altshuler, R. Rox Anderson Ilya Yaroslavsky, G. B. (n.d.). *EFFECTS OF FLUENCE AND ULSE D URATION FOR F LASHLAMPE XPOSURE ON HAIR P FOLLICLES*.
17. Ds, B., Ji, C., Mi, R., We, R., & Wang B. (2009). Clinical role and application of superficial chemical peels in today's practice. In *Journal of Drugs in Dermatology : JDD* (Vol. 8, Issue 9).
18. El-Domyati, M., El-Ammawi, T. S., Medhat, W., Moawad, O., Brennan, D., Mahoney, M. G., & Uitto, J. (2011). Radiofrequency facial rejuvenation: Evidence-based effect. *Journal of the American Academy of Dermatology*, 64(3),

- 524–535.
<https://doi.org/10.1016/j.jaad.2010.06.045>
19. Fedok, F., Nolst Trenité, G. J., Becker, D. G., Gausas, R., Editor, G., Bucky, L. P., Sarwer, D. B., Crerand, C. E., & Didie, E. R. (2003). Body Dysmorphic Disorder in Cosmetic Surgery Patients. In *Facial Plastic Surgery* (Vol. 19, Issue 1).
 20. Goh, C. (2009). The need for evidence-based aesthetic dermatology practice. *Journal of Cutaneous and Aesthetic Surgery*, 2(2), 65. <https://doi.org/10.4103/0974-2077.58518>
 21. Goldberg, D. J. (2012). Current trends in intense pulsed light. *Journal of Clinical and Aesthetic Dermatology*, 5(6), 45–53.
 22. Hi, A., Sc, C., Lt, N., & Simerdip K. (2021). The efficacy of intense pulse light among patients with skin type III-IV in acute facial acne: The Malaysian experience. In *The Medical Journal of Malaysia* (Vol. 76, Issue 3).
 23. Jewell, M. L., Weiss, R. a., Baxter, R. a., Cox, S. E., Dover, J. S., Donofrio, L. M., Glogau, R. G., Kane, M. C., Martin, P., Lawrence, I. D., & Schlessinger, J. (2012). Safety and Tolerability of High-Intensity Focused Ultrasonography for Noninvasive Body Sculpting: 24-Week Data From a Randomized, Sham-Controlled Study. *Aesthetic Surgery Journal*, 32(7), 868–876. <https://doi.org/10.1177/1090820X12455190>
 24. Kalashnikova, N. G., Jafferany, M., & Lotti, T. (2021). Management and prevention of laser complications in aesthetic medicine: An analysis of the etiological factors. In *Dermatologic Therapy* (Vol. 34, Issue 1). Blackwell Publishing Inc. <https://doi.org/10.1111/dth.14373>
 25. Kalil, C. L. P. V., Reinehr, C. P. H., & Milman, L. M. (2017). Intense Pulsed Light: Review of clinical indications. *Surgical and Cosmetic Dermatology*, 9(1), 9–16. <https://doi.org/10.5935/scd1984-8773.201791967>
 26. Kang, W. H., Kim, Y. J., Pyo, W. S., Park, S. J., & Kim, J. H. (2009). Atrophic acne scar treatment using triple combination therapy: Dot peeling, subcision and fractional laser. *Journal of Cosmetic and Laser Therapy*, 11(4), 212–215. <https://doi.org/10.3109/14764170903134326>
 27. Karimipour, D. J., Karimipour, G., & Orringer, J. S. (2010). Microdermabrasion: An evidence-based review. In *Plastic and Reconstructive Surgery* (Vol. 125, Issue 1, pp. 372–377). <https://doi.org/10.1097/PRS.0b013e3181c2a583>
 28. Kazuhiro Hayashi. (2007). Importance of a Psychiatric Approach in Cosmetic Surgery. *Aesthetic Surgery Journal*, 27, 396–401. <https://doi.org/doi:10.1016.j.asj.2007.05.010>
 29. Kim, J. Y., Choi, M., Nam, C. H., Kim, J. S., Kim, M. H., Park, B. C., & Hong, S. P. (2016). Treatment of melasma with the photoacoustic twin pulse mode of low-fluence 1,064 nm Q-Switched Nd:YAG laser. *Annals of Dermatology*, 28(3), 290–296. <https://doi.org/10.5021/ad.2016.28.3.290>
 30. Kumaresan, M., & Srinivas, C. (2011). Lasers for vascular lesions: Standard guidelines of care. *Indian Journal of Dermatology, Venereology, and Leprology*, 77(3), 349. <https://doi.org/10.4103/0378-6323.79728>
 31. Lecocq, C., Pirard, D., del Marmol, V., & Berlingin, E. (2013). [The use of lasers in dermatology]. *L'utilisation Des Lasers En Dermatologie.*, 34(1), 12–19. <http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=medl&NEWS=N&AN=23534310>
 32. Lee, W., Kim, J. S., Oh, W., Koh, I. S., & Yang, E. J. (2019). Nasal dorsum augmentation using soft tissue filler injection. *Journal of Cosmetic Dermatology*, 18(5), 1254–1260. <https://doi.org/10.1111/jocd.13018>
 33. Mohd Shahrin, U. (2019). *Laser and Light in Aesthetic Practice: Unlocking the Secret Codes* (1st ed.). EMS Publication.
 34. Mohd Shahrin U. (2019). *Sound Waves in Aesthetic Practice- Unlocking the Secret Codes* (1st ed.). EMS Publication.
 35. Mohd Shahrin U. (2020). *The Naked Truth About Aesthetic Treatment: Unlocking The Secret Codes*. In *EMS Publication*.
 36. Nahai, F. (2011). Evidence-based medicine in aesthetic surgery. In *Aesthetic Surgery Journal* (Vol. 31, Issue 1, pp. 135–136). <https://doi.org/10.1177/1090820X10390924>
 37. Narurkar, V. A., Cohen, J. L., Dayan, S., Kaminer, M. S., Rivkin, A., Shamban, A., Sykes, J. M., Teller, C. F., Weinkle, S. H., Philip Werschler, W., Drinkwater, A., Pucci, M. L., & Gallagher, C. J. (2016). A Comprehensive approach to multimodal facial aesthetic treatment: Injection techniques and treatment characteristics from the HARMONY study. *Dermatologic Surgery*, 42, S177–S191. <https://doi.org/10.1097/DSS.0000000000000743>

38. Niamtu, J. (2003). Botulinum toxin A: A review of 1,085 oral and maxillofacial patient treatments. *Journal of Oral and Maxillofacial Surgery*, 61(3), 317–324. <https://doi.org/10.1053/joms.2003.50069>
39. Nikalji, N., Patil, S., Sakhiya, J., Godse, K., & Nadkarni, N. (2012). Complications of medium depth and deep chemical peels. *Journal of Cutaneous and Aesthetic Surgery*, 5(4), 254. <https://doi.org/10.4103/0974-2077.104913>
40. Percec, I., Bertucci, V., Solish, N., Wagner, T., Nogueira, A., & Mashburn, J. (2020). An Objective, Quantitative, Dynamic Assessment of Hyaluronic Acid Fillers That Adapt to Facial Movement. *Plastic and Reconstructive Surgery*, 145(2), 295e–305e. <https://doi.org/10.1097/PRS.0000000000006461>
41. Polnikorn, N., International, C., Resort, H., Depth, T., Necrosis, T., Suretouch, A., Tm, S., View, L. S., & Polnikorn, N. (2016). *PicoToning : A Novel Laser Skin Toning Approach for the Treatment of Asian Skin Types. January*.
42. Preissig, J., Hamilton, K., & Markus, R. (2012). Current laser resurfacing technologies: A review that delves beneath the surface. *Seminars in Plastic Surgery*, 26(3), 109–116. <https://doi.org/10.1055/s-0032-1329413>
43. Putra, I. B., Jusuf, N. K., & Dewi, N. K. (2019). Utilisation of cryolipolysis among asians: A review on efficacy and safety. In *Open Access Macedonian Journal of Medical Sciences* (Vol. 7, Issue 9, pp. 1548–1554). Open Access Macedonian Journal of Medical Sciences. <https://doi.org/10.3889/oamjms.2019.318>
44. Rousseaux, I. (2015). Peri-Orbital Non-Invasive and Painless Skin Tightening-Safe and Highly Effective Use of Multisource Radio-Frequency Treatment Platform. *Journal of Cosmetics, Dermatological Sciences and Applications*, 05(03), 206–211. <https://doi.org/10.4236/jcdsa.2015.53025>
45. Sarkar, R., Garg, V., Arya, L., & Arora, P. (2012). Lasers for treatment of melasma and post-inflammatory hyperpigmentation. *Journal of Cutaneous and Aesthetic Surgery*, 5(2), 93. <https://doi.org/10.4103/0974-2077.99436>
46. Shek, S., Yu, C., Yeung, C. K., Kono, T., & Chan, H. H. (2009). The use of focused ultrasound for non-invasive body contouring in Asians. *Lasers in Surgery and Medicine*, 41(10), 751–759. <https://doi.org/10.1002/lsm.20875>
47. Slayton, M. H., & Gliklich, R. E. (2007). *Selective Creation of Thermal Injury Zones in the Superficial Musculoaponeurotic System Using Intense Ultrasound Therapy*. 9, 22–29.
48. SousH, N., Lin, A., AxFoRD-GA TLEY, R. A., Strangman, N. M., & Kane, M. (n.d.). *A Randomized, Single-Blind, Postmarketing Study of Multiple Energy Levels of High-Intensity Focused Ultrasound for Noninvasive Body Sculpting*.
49. Uygur, S., Eryilmaz, T., Bulam, H., Yavuzer, R., & Latifoglu, O. (2013). The quantitative effect of botulinum toxin a over brow height. *Journal of Craniofacial Surgery*, 24(4), 1285–1287. <https://doi.org/10.1097/SCS.0b013e318292c80c>
50. Wall, T. L. (2007). Current concepts: laser treatment of adult vascular lesions. *Semin. Plast. Surg.*, 21(3), 147–158. <https://doi.org/10.1055/s-2007-991183>
51. Welch, A. J., Torres, J. H., & Cheong, W.-F. (1989). Laser physics and laser-tissue interaction. *Texas Heart Institute Journal*, 16(3), 961–964. <https://doi.org/10.1002/lapl.200910145>
52. Zipser, M. C., Mangana, J., Oberholzer, P. A., French, L. E., & Dummer, R. (2010). Melanoma after laser therapy of pigmented lesions - Circumstances and outcome. *European Journal of Dermatology*, 20(3), 334–338. <https://doi.org/10.1684/ejd.2010.0933>