

Introduction to Pharmacology

Pharmacology for Cosmetic and Laser Practice

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Second Stage

Duration: 2 hours

Lecture Overview

This lecture introduces the basic language of **pharmacology**, explains the principal methods used to classify **drugs**, and connects medication knowledge with safe cosmetic and laser practice. The lecture provides the foundation for later study of **pharmacokinetics**, **pharmacodynamics**, **topical agents**, **antimicrobials**, **anaesthetics**, and **anti-inflammatory drugs**.

Learning Outcomes

By the end of this lecture, the student should be able to:

- Define **pharmacology**, **drug**, **medicine**, **active ingredient**, **dosage form**, and **route of administration**.
- Identify the main branches of **pharmacology**.
- Distinguish **generic names** from **brand names**.
- Classify drugs by therapeutic use, mechanism, body system, route, source, and legal availability.
- Recognize common dosage forms used in dermatology and cosmetic practice.
- Explain the scientific relationship between pharmacology and cosmetic or laser practice.
- Recognize common medication-related changes in the skin, hair, nails, bleeding, **photosensitivity**, and wound healing.
- Distinguish a predictable **side effect** from a possible allergic or serious adverse reaction.
- Obtain a basic **medication history** and identify situations that require **medical review**.

Opening Clinical Scenario

A patient attends a clinic for a facial laser procedure. She reports using doxycycline for acne, a potent topical corticosteroid on her face, and an oral anticoagulant. Before proceeding, the practitioner must understand why each medication matters, what additional information is required, and whether the patient needs medical assessment.

Discussion question: Why should a cosmetic or laser practitioner study pharmacology?

1 Introduction to Pharmacology

1.1 Definition

Pharmacology is the science that studies **drugs** and their effects on living organisms. It examines how **drugs** enter and move through the body, how they produce beneficial and harmful effects, how the body changes and removes them, and how they can be used safely in clinical practice.

The word **pharmacology** is derived from the Greek words *pharmakon*, meaning **drug** or **medicine**, and *logos*, meaning study. **Pharmacology** therefore means the scientific study of **drugs**.

1.2 What Is a Drug

A **drug** is a chemical or biological substance that changes a physiological or biochemical function in the body. **Drugs** may be used to prevent disease, assist diagnosis, treat or control disease, relieve symptoms, or modify a body function.

Purpose	Example	Main effect
Prevention	Vaccines	Reduce the risk of specific infections
Diagnosis	Diagnostic contrast agents	Improve visualization during diagnostic procedures
Treatment	Antibiotics	Treat susceptible bacterial infections
Symptom relief	Paracetamol	Relieve pain and reduce fever
Modification of function	Botulinum toxin type A	Temporarily reduces targeted muscle activity

1.3 Drug and Medicine

Drug: the active chemical or biological substance that produces an effect in the body.

Medicine: a prepared pharmaceutical product containing one or more active **drugs** together with **inactive ingredients**, supplied in a form suitable for administration.

Example: Lidocaine is the active drug. A lidocaine cream contains lidocaine together with a vehicle and other ingredients, forming the finished medicine. In everyday speech, the words drug and medicine are often used interchangeably.

1.4 Basic Pharmacological Terms

Term	Meaning
Active ingredient	The component responsible for the intended pharmacological effect.
Dosage form	The physical form of a medicine , such as a tablet, capsule, cream, gel, or injection.
Route of administration	The path by which a medicine enters or is applied to the body.
Dose	The amount of a drug administered at one time.
Dosage regimen	The dose , route, frequency, and duration of treatment.
Indication	A disease, symptom, or clinical situation for which a drug is used.

Term	Meaning
Contraindication	A situation in which a drug or procedure should not be used because the risk may be unacceptable.
Therapeutic effect	The desired beneficial effect of a drug .
Adverse drug reaction	A harmful or unintended response associated with the use of a medicine .
Drug interaction	A change in a drug's effect caused by another drug , substance, food, or clinical factor.

1.5 Sources of Drugs

Source	Description	Examples
Plant	Substances originally obtained from plants	Atropine, morphine, digoxin
Animal	Products obtained from animal tissues or biological materials	Some heparin products and antivenoms
Mineral	Naturally occurring inorganic substances	Zinc oxide and magnesium sulfate
Synthetic	Compounds produced by chemical synthesis	Paracetamol and lidocaine
Biotechnology	Products created using living cells or recombinant technology	Insulin and monoclonal antibodies
Microorganisms	Compounds produced by microorganisms or derived from them	Penicillin

1.6 Main Branches of Pharmacology

Branch	Main question	Example
Pharmacokinetics	What does the body do to the drug ?	Absorption, distribution, metabolism, and excretion
Pharmacodynamics	What does the drug do to the body?	Mechanism of action and dose-response relationship

Branch	Main question	Example
Pharmacotherapeutics	How are drugs used to prevent or treat disease?	Selecting an antimicrobial for a confirmed infection
Clinical pharmacology	How can drugs be used safely and effectively in humans?	Evaluating benefit, risk, dose , and interactions
Toxicology	What harmful effects can chemicals and drugs produce?	Local anaesthetic systemic toxicity
Pharmacovigilance	How are suspected adverse effects detected and monitored after use?	Reporting an unexpected serious reaction

1.7 Pharmacokinetics and Pharmacodynamics

Pharmacokinetics describes the movement of a **drug** through the body. Its four major processes are **absorption**, **distribution**, **metabolism**, and **excretion**, commonly abbreviated as **ADME**. These processes determine how quickly **drug** concentrations rise, how long the **drug** remains available, and how it leaves the body.

Pharmacodynamics describes the effects of a **drug** on the body. It includes the **drug's** molecular target, **mechanism of action**, **therapeutic effect**, adverse effects, and the relationship between **dose** or concentration and response. Both areas will be discussed in detail in later lectures.

1.8 Drug Names

Type of name	Description	Example
Chemical name	Describes the chemical structure and is mainly used in scientific chemistry.	The systematic chemical name of lidocaine
Generic name	The standard non-proprietary name of the active drug .	Lidocaine
Brand name	A trade name selected by a manufacturer.	A brand containing lidocaine

One generic **drug** may be sold under several **brand names**. Students should learn **generic names** because they identify the **active ingredient** more reliably than **brand names**, which vary between companies and countries.

2 Drug Classification

Drug classification organizes **medicines** into groups that share a clinical use, mechanism, chemical structure, target organ system, route, source, or regulatory status. A single **drug** can belong to

several classifications at the same time. For example, lidocaine can be classified as a local anaesthetic by therapeutic use, a voltage-gated sodium channel blocker by mechanism, an amide by chemical class, and a **topical** or injectable **drug** by route.

2.1 Classification by Therapeutic Use

This method groups drugs according to their main clinical purpose.

Therapeutic class	Main use	Examples relevant to skin or procedures
Analgesics	Relief of pain	Paracetamol and selected NSAIDs
Local anaesthetics	Temporary loss of sensation in a limited area	Lidocaine and prilocaine
Antibiotics	Treatment of susceptible bacterial infections	Doxycycline, clindamycin, and mupirocin
Antifungals	Treatment of fungal infections	Clotrimazole, terbinafine, and fluconazole
Antivirals	Treatment or suppression of viral infections	Acyclovir and valacyclovir
Anti-inflammatory drugs	Reduction of inflammation	Corticosteroids and selected NSAIDs
Antihistamines	Reduction of histamine-mediated symptoms	Cetirizine and loratadine
Retinoids	Treatment of acne and disorders of keratinization	Tretinoin, adapalene, and isotretinoin
Immunomodulators	Modification of immune responses	Tacrolimus and biologic medicines
Anticoagulants and antiplatelets	Reduction of blood clot formation	Warfarin, apixaban, aspirin, and clopidogrel

2.2 Classification by Mechanism of Action

The **mechanism of action** explains how a **drug** produces its effect at a molecular, cellular, or physiological level. **Drugs** may act on **receptors**, **enzymes**, **ion channels**, **transporters**, microorganisms, or immune targets.

Mechanism	Example	Result
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Mechanism	Example	Result
Receptor activation	Selected antihistamines act as H1 receptor inverse agonists	Reduce histamine-related symptoms
Receptor blockade	Beta blockers block beta-adrenoceptors	Reduce beta-adrenergic effects
Ion channel blockade	Lidocaine blocks voltage-gated sodium channels	Prevents nerve impulse conduction
Enzyme inhibition	Finasteride inhibits type II 5-alpha-reductase	Reduces conversion of testosterone to dihydrotestosterone
Microbial target inhibition	Many antibiotics inhibit a bacterial process	Stops bacterial growth or causes bacterial death
Immune target modulation	Biologic medicines target selected cytokines or receptors	Modify a specific immune pathway

2.3 Classification by Body System or Site of Action

Drugs may also be grouped according to the organ or physiological system on which they mainly act. Common categories include dermatological drugs, cardiovascular drugs, gastrointestinal drugs, respiratory drugs, endocrine drugs, and central nervous system drugs. Some medicines affect more than one system, so this classification is practical but not exclusive.

2.4 Classification by Route of Administration

Route	Description	Examples
Topical	Applied directly to skin or a mucosal surface	Creams, ointments, lotions, gels, and solutions
Oral	Swallowed and absorbed through the gastrointestinal tract	Tablets, capsules, and oral liquids
Intravenous	Injected directly into a vein	Emergency medicines and infusions
Intramuscular	Injected into a muscle	Selected vaccines and medications
Subcutaneous	Injected into subcutaneous tissue	Insulin and selected biologic medicines

Route	Description	Examples
Intradermal	Injected into the dermis	Selected skin tests and procedural applications
Transdermal	Delivered across the skin for systemic absorption	Medicated patches
Inhalational	Delivered through the respiratory tract	Inhaled bronchodilators and anaesthetic gases

The route affects the onset, intensity, duration, convenience, and risk of treatment. Intravenous administration provides immediate systemic availability, while **topical** administration is commonly chosen to concentrate treatment at the skin and limit systemic exposure. **Topical** use can still produce **systemic absorption**, especially when applied to damaged skin, large areas, or under occlusion.

2.5 Classification by Dosage Form

Dosage form	Typical characteristics	Common practical use
Ointment	Greasy and occlusive	Dry, thick, or scaly lesions
Cream	Less greasy and cosmetically acceptable	Many inflammatory conditions and moist body areas
Lotion	Fluid and easy to spread	Large or hairy areas
Gel	Light and often fast drying	Oily or acne-prone areas
Solution	Drug dissolved in a liquid vehicle	Scalp, hairy areas, or cleansing applications
Foam	Spreads easily with limited rubbing	Scalp and hairy areas
Tablet or capsule	Solid oral dosage form	Systemic treatment
Injection	Sterile preparation administered with a needle or device	Local or systemic treatment

The **vehicle** is clinically important in **topical** treatment. It influences **drug** release, hydration, penetration, comfort, adherence, and suitability for a particular body site.

2.6 Classification by Source

Drugs may be classified as natural, semi-synthetic, synthetic, or biological. This classification describes origin or production method, but natural origin does not automatically mean safer. Safety depends on dose, purity, route, patient factors, interactions, and correct use.

2.7 Classification by Legal Availability

Category	General meaning
Prescription medicine	Requires authorization by an appropriately licensed prescriber.
Over-the-counter medicine	May be supplied without a prescription under applicable regulations.
Controlled medicine	Subject to additional legal controls because of risks such as misuse, dependence, or diversion.

The exact legal category can differ between countries. Over-the-counter availability does not mean that a product is free from adverse effects, contraindications, or interactions.

2.8 The WHO ATC Classification System

The World Health Organization Anatomical Therapeutic Chemical system classifies active substances at several levels according to the organ or system on which they act and their therapeutic, pharmacological, and chemical properties. It is widely used for **drug** utilization research and comparison of **medicine** use. Students do not need to memorize ATC codes in this introductory lecture, but should recognize that formal international classification systems exist.

3 Importance in Cosmetic and Laser Practice

Pharmacology is directly connected to cosmetic and laser practice because **drugs** can change the structure, function, and response of the skin. A procedure is influenced by the patient's skin condition, general health, medication use, and the type of treatment planned. Pharmacological knowledge helps the practitioner recognize medication-related changes, anticipate complications, ask appropriate questions, document relevant information, and seek medical advice when required. It does not replace diagnosis, prescribing authority, or specialist assessment.

3.1 Why Pharmacology Is Essential for the Graduate

A graduate of a Cosmetic and Laser Techniques program works at the point where skin biology, **medicines**, devices, and patient safety meet. Even when the graduate does not prescribe **medicines**, medication knowledge remains a core professional competency. The practitioner must recognize how a **medicine** can change the skin before treatment, alter the tissue response during treatment, and influence healing after treatment.

Many cosmetic complaints may be caused, worsened, or modified by medicines. Acneiform eruptions, pigmentation changes, hair loss or excessive hair growth, photosensitivity, dryness, bruising, telangiectasia, delayed healing, and allergic reactions may have a pharmacological cause. If the medication history is ignored, the practitioner may mistake an adverse drug effect for a primary cosmetic problem and select an unsuitable procedure.

Pharmacological factor	Possible cosmetic or procedural effect	Why the graduate needs to know
Altered skin barrier	Dryness, irritation, increased penetration, or sensitivity	Helps avoid excessive irritation and inappropriate product combinations
Photosensitivity	Exaggerated response to ultraviolet or visible light	May change the safety of laser, IPL, and other light-based procedures
Reduced coagulation	Bruising, prolonged bleeding, or haematoma	Important before injections and invasive procedures
Immune suppression	Infection risk or altered inflammatory response	May require postponement or medical coordination
Impaired healing	Delayed recovery, erosion, or scar-related complications	Affects procedure selection, timing, and aftercare
Pigment alteration	Hyperpigmentation or hypopigmentation	May affect diagnosis, counselling, and treatment expectations
Hair and nail effects	Drug-related alopecia, hypertrichosis, or nail change	Prevents misclassification as a purely cosmetic disorder
Local anaesthetic exposure	Allergy, cardiovascular effects, or neurological toxicity	Requires dose awareness, monitoring, and emergency readiness

Pharmacology also helps the graduate communicate accurately with dermatologists, pharmacists, and other clinicians. Instead of saying that a patient uses 'an acne tablet' or 'a blood thinner,' the graduate can document the generic name, dose, route, duration, indication, and observed reaction. This improves referral quality and continuity of care.

3.2 Adverse Effects and Their Cosmetic Relevance

An **adverse drug reaction** is a harmful or unintended response associated with the use of a **medicine**. Recognizing adverse effects is especially important in cosmetic practice because many reactions first appear in the skin, hair, nails, or mucosa. The reaction may also increase the risk of a procedure even when it is unrelated to the patient's cosmetic complaint.

Adverse effects can be considered in several practical ways:

Pattern	Description	Example relevant to practice
Predictable and dose related	Related to the known pharmacological action and often increases with dose or exposure	Bruising associated with anticoagulant therapy

Pattern	Description	Example relevant to practice
Unpredictable	Not explained simply by the usual action or dose	Drug hypersensitivity in a susceptible patient
Local	Occurs mainly at the application or injection site	Irritant dermatitis from a topical product
Systemic	Affects the body beyond the application site	Neurological or cardiovascular toxicity after excessive local anaesthetic exposure
Immediate	Appears within minutes or hours	Urticaria, angioedema, or an acute injection reaction
Delayed	Appears after repeated exposure or over a longer period	Skin atrophy after prolonged potent topical corticosteroid misuse

A **side effect** is not automatically an allergy. A **side effect** may be a predictable extension of the **drug's** action, while **drug allergy** involves an immune mechanism. The distinction matters because an inaccurate allergy label can limit future treatment, while failure to recognize a true allergic reaction can place the patient at risk.

Medication-related findings that a graduate should recognize include:

- Erythema, dryness, peeling, burning, or irritant dermatitis.
- Urticaria, angioedema, widespread rash, blistering, or mucosal involvement.
- Photosensitivity and exaggerated reactions after light exposure.
- Easy bruising, prolonged bleeding, or petechiae.
- Skin atrophy, telangiectasia, striae, or steroid-related acneiform eruptions.
- Hyperpigmentation, hypopigmentation, or changes in the colour of skin and nails.
- Drug-related hair loss or excessive hair growth.
- Delayed healing, secondary infection, or unexpected inflammation after a procedure.

The graduate's role is to recognize the possible relationship, document the finding, stop or **postpone** an elective procedure when safety is uncertain, and refer for medical assessment. The graduate should not independently diagnose a **drug** eruption, discontinue a prescribed **medicine**, or treat a serious reaction outside the authorized **scope of practice**.

3.3 Medication History Before a Procedure

A basic pre-procedure **medication history** should include:

- All prescription **medicines**, including tablets, injections, creams, and eye drops.
- **Over-the-counter** products, vitamins, supplements, and herbal preparations.
- The **active ingredient**, **dose**, route, frequency, duration, and reason for use when known.
- Recent courses of antibiotics, **retinoids**, **corticosteroids**, or **immunosuppressive medicines**.
- Anticoagulant or **antiplatelet** treatment.

- Previous allergy, adverse reaction, fainting episode, or problem with local anaesthesia.
- **Pregnancy or breastfeeding** when relevant to the planned product or procedure.
- Previous cosmetic procedures and any complications.

Medication lists should be reviewed before the procedure and updated when the treatment plan changes. When the effect of a medicine on a planned procedure is uncertain, consult the treating physician, pharmacist, approved product information, and current procedural guidance.

3.4 Medications That May Affect Bleeding or Bruising

Anticoagulants and antiplatelet medicines may increase bruising or bleeding during injections or invasive procedures. Examples include warfarin, direct oral anticoagulants, aspirin, and clopidogrel. Some supplements may also affect haemostasis. The significance depends on the medicine, indication, procedure, dose, patient factors, and bleeding risk.

A practitioner should not advise a patient to stop an anticoagulant or antiplatelet medicine without authorization from the prescribing clinician. Unsupervised interruption may expose the patient to serious thrombotic harm.

3.5 Photosensitising Medicines

Some medicines can increase sensitivity to ultraviolet or visible light and may increase the risk of an exaggerated skin reaction. Examples may include tetracycline antibiotics, thiazide diuretics, amiodarone, and selected other medicines. The degree of risk varies with the drug, dose, wavelength, procedure, skin type, and individual response.

Before a light-based or laser procedure, review the medicine and the device protocol. If clinically relevant photosensitivity is suspected, postpone the procedure or obtain medical guidance according to local policy and current evidence.

3.6 Retinoids

Topical retinoids can cause dryness, irritation, erythema, and increased skin sensitivity. Oral isotretinoin commonly causes marked mucocutaneous dryness and may affect procedural planning. Decisions about timing should consider the specific procedure, treatment intensity, skin condition, current evidence, and specialist advice rather than applying one rule to every procedure. Retinoids also require strict pregnancy precautions according to the product and local regulations.

3.7 Corticosteroids

Appropriate corticosteroid therapy can reduce inflammation, but prolonged or inappropriate use of potent topical corticosteroids may cause skin atrophy, telangiectasia, striae, easy bruising, acneiform eruptions, and masking or worsening of some infections. Systemic or extensive corticosteroid exposure may also influence immune function and wound healing. The treatment area should be examined carefully before an elective procedure.

3.8 Immunosuppressive and Immunomodulatory Medicines

Systemic corticosteroids, conventional immunosuppressants, targeted therapies, and biologic medicines may influence infection risk, inflammatory response, or healing. Risk varies substantially

between drugs and patients. Elective invasive procedures may require coordination with the treating specialist, particularly when there is active infection, poor healing, or significant immune suppression.

3.9 Local Anaesthetics

Local anaesthetics reduce sensation by interrupting nerve conduction. Safe use requires attention to the **active ingredient**, concentration, total **dose**, application area, exposure time, skin integrity, patient age and weight, relevant medical conditions, and other products containing the same anaesthetic. Excessive exposure can cause serious **systemic toxicity**. Emergency procedures and referral pathways must be available wherever **local anaesthetics** are used.

3.10 Drug Allergy and Adverse Reactions

A reported **drug allergy** should be clarified. Ask which **drug** caused the reaction, what happened, when it occurred, and whether treatment was required. Allergy is an immune-mediated reaction and should not be used as a general label for every predictable **side effect**. Severe reactions, respiratory symptoms, facial or tongue swelling, hypotension, or widespread blistering require urgent medical care.

3.11 Pregnancy and Breastfeeding

Pregnancy and breastfeeding may change the suitability of medicines and elective procedures. Products such as systemic retinoids have major pregnancy-related risks, while other drugs require individualized assessment. Practitioners should follow current product information, local policy, and medical guidance rather than assuming that a topical or cosmetic product is automatically safe.

3.12 Professional Responsibility

A cosmetic or laser practitioner should:

- Work within the legal **scope of practice** and level of training.
- Use approved products and follow manufacturer instructions and clinic protocols.
- Record **medication history**, allergies, assessment, consent, product details, and adverse events.
- **Avoid diagnosing, prescribing, or changing treatment without appropriate authority.**
- **Never instruct a patient to stop an essential medicine without the prescribing clinician's approval.**
- **Refer or postpone when risk cannot be assessed safely.**
- **Recognize emergencies and activate the appropriate emergency response.**

4 Applied Clinical Examples

Case 1 Doxycycline and Light Based Treatment

A patient receiving doxycycline for acne requests an intense pulsed light treatment. The practitioner should confirm the indication, dose, duration, recent skin reaction, sun exposure, device wavelength, and clinic protocol. Because doxycycline may cause photosensitivity, the procedure requires an individualized risk assessment and may need postponement or medical advice.

Case 2 Anticoagulant Use Before an Injectable Procedure

A patient taking apixaban requests an injectable cosmetic procedure. The medicine may increase bruising or bleeding, but the practitioner must not advise the patient to stop it independently. The practitioner should assess the procedure's bleeding risk, document the medicine, explain likely bruising, and obtain medical guidance when required.

Case 3 Potent Topical Corticosteroid Misuse

A patient has used a potent topical corticosteroid on the face for several months and now has erythema, telangiectasia, and thin sensitive skin. An elective laser procedure should not proceed until the skin condition has been medically assessed and an appropriate treatment plan has been established.

Case 4 Multiple Products Containing Lidocaine

A patient has applied a lidocaine-containing cream at home and is offered another local anaesthetic product in the clinic. The total exposure from all products must be considered. Repeated application, large treatment areas, damaged skin, occlusion, and prolonged contact can increase systemic absorption and toxicity risk.

5 Lecture Summary

- **Pharmacology** studies **drugs**, their movement through the body, their effects, clinical uses, and risks.
- A drug may be classified in several ways, including therapeutic use, mechanism, body system, route, dosage form, source, and legal availability.
- The route and dosage form influence onset, duration, absorption, local effect, and systemic exposure.
- **Medication history** is essential before cosmetic and laser procedures.
- Medicines may influence bleeding, photosensitivity, skin integrity, infection risk, healing, anaesthetic safety, and pregnancy-related risk.
- Patient safety requires documentation, informed assessment, adherence to scope of practice, and referral when risk is uncertain.

6 Review Questions

1. Define pharmacology.
2. What is the difference between a drug and a medicine?
3. What do pharmacokinetics and pharmacodynamics study?
4. List four methods used to classify drugs.
5. Why is the generic name more useful than a brand name for identifying an active ingredient?
6. Give two advantages and two limitations of topical administration.
7. Why should anticoagulants not be stopped without the prescribing clinician's authorization?
8. List five items that should be included in a pre-procedure medication history.
9. How can potent topical corticosteroid misuse affect cosmetic procedure planning?
10. When should a cosmetic or laser practitioner seek medical advice or postpone a procedure?

7 Multiple Choice Questions

1. Pharmacokinetics mainly describes:

- A. What the drug does to the body
- B. What the body does to the drug
- C. Drug cost and availability
- D. The legal status of a medicine

2. Which term refers to the standard non-proprietary name of a drug?

- A. Chemical name
- B. Brand name
- C. Generic name
- D. Company name

3. Which dosage form is usually the most occlusive?

- A. Ointment
- B. Lotion
- C. Solution
- D. Foam

4. Lidocaine is classified as a local anaesthetic according to its:

- A. Therapeutic use
- B. Source
- C. Legal category only
- D. Manufacturer

5. A drug applied to the skin:

- A. Can never reach systemic circulation
- B. Always has a systemic effect
- C. May be absorbed systemically under some conditions
- D. Has no adverse effects

6. Which medicine group may increase bruising during an invasive procedure?

- A. Anticoagulants
- B. Antifungals
- C. Antacids
- D. Laxatives

7. Before advising interruption of an anticoagulant, the practitioner should:

- A. Stop it for every procedure
- B. Ask the patient to decide
- C. Obtain authorization from the prescribing clinician
- D. Replace it with aspirin

8. Prolonged misuse of a potent topical corticosteroid may cause:

- A. Skin atrophy and telangiectasia

- B. Increased skin thickness only
- C. Permanent local anaesthesia
- D. Improved resistance to infection

9. Which statement about over-the-counter medicines is correct?

- A. They are completely free from risk
- B. They cannot interact with prescription drugs
- C. They can still cause adverse effects and interactions
- D. They do not need to be included in medication history

10. The safest action when the effect of a medicine on a laser procedure is uncertain is to:

- A. Ignore the medicine
- B. Reduce the laser setting without assessment
- C. Review reliable guidance and seek medical advice
- D. Ask the patient to stop all medicines

Answer Key

1 B 2 C 3 A 4 A 5 C 6 A 7 C 8 A 9 C 10 C

8 Suggested Teaching Plan

Time	Teaching activity
0 to 10 minutes	Opening scenario, discussion question, and learning outcomes
10 to 35 minutes	Definitions, terminology, drug names, sources, and branches of pharmacology
35 to 70 minutes	Drug classification, routes, and dosage forms
70 to 100 minutes	Importance in cosmetic and laser practice
100 to 112 minutes	Applied clinical cases
112 to 120 minutes	Review questions, MCQs, and conclusion

9 References and Further Reading

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