Chapter 18: Chemical Texture Services

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NOTES TO THE INSTRUCTOR

A study of permanent waving, reformation curls, and chemical hair relaxing provides barbering students with the ability to offer alternative services to their clients. For students in those states that require these services in the barbering curriculum, this chapter will provide the basics of chemical texture services chemistry and application procedures. It is recommended that instructors review the similarities and differences of the products and procedures in some depth to facilitate and ensure students' understanding of the information.

STUDENT PREPARATION: Read Chapter 18: Chemical Texture Services

STUDENT MATERIALS

- *Milady's Standard Professional Barbering* textbook
- *Milady's Professional Barbering Student Workbook*
- *Milady's Professional Barbering Student CD-ROM*
- Writing materials
- Mannequin and wet cape

- Permanent wave tools and implements
- Bowl and applicator brush

LEARNING OBJECTIVES

Upon completion of this lesson, students should be able to:

1. Explain the effects of chemical texture services on the hair.
2. Identify the similarities and differences between chemical texture services.
3. Discuss the factors of hair analysis for chemical texture services.
4. Perform a permanent wave service.
5. Perform a reformation curl service.
6. Perform a hair-relaxing service.

ALLOTTED TIME: Two to six hours, depending on depth of study and range of activities.

TEACHING AIDS

- *Milady's Standard Professional Barbering* textbook
- *Milady's Professional Barbering Instructor Slides*
- Whiteboard or chalkboard; dry-erase markers or chalk
- CD/DVD player or overhead projector
- Mannequin and wet cape
- Permanent waving products, tools, and implements
- Reformation curl products, tools, and implements
- Chemical hair relaxing products, tools, and implements

EDUCATOR REFERENCES

- *Milady's Standard Professional Barbering* textbook
- *Milady's Professional Barbering Course Management Guide*

LESSON OUTLINE

1. Introduction

A. Overview
1. Chemical texture services create permanent chemical changes in hair structure and texture.
2. May curl straight hair, resize the curl in curly hair types, or straighten over-curly hair.
3. New hair growth requires retouch applications.
4. Practical, versatile, and lucrative services; provide clients with alternative hairstyle designs.

B. Chemical Texture Services Defined
1. Permanent waving: chemically restructures hair into a different wave pattern.
   a. Most services performed to create waves or curls in straighter hair types.
   b. Requires the use of rods, end wraps, waving lotion, and neutralizer.
   c. Effects: increases fullness; redirects growth patterns until new growth occurs; provides greater styling control.
2. Reformation curl: restructures very curly hair into a larger curl pattern.
   a. Also known as a soft-curl perm, Jheri curl, or simply a curl.
   b. Requires relaxing product to partially straighten hair, rods, end wraps, waving lotion, and neutralizer.
   c. Procedure is part chemical hair relaxer service and part permanent waving service.
   d. Provides an alternative to the natural look and total straightening.

3. Chemical hair relaxing: rearranges the structure of over-curly hair into a straighter hair form.
   a. Requires relaxing cream, neutralizer or neutralizing shampoo, and conditioner.
   b. Process should leave hair in a soft, straightened form.
   c. May be followed with wet setting, wrapping, or thermal styling.
4. Chemical services require maintenance and periodic reapplications as new growth appears.

2. The Nature of Chemical Texture Services

A. Chemistry

1. Chemical texture services create permanent changes in hair structure and appearance.
2. Cuticle and cortex most affected by chemical texture services.
   a. Strength of cuticle determines degree of resistance to chemical change.
   b. Alkaline solutions or substances soften and swell the cuticle and allow penetration into cortex.
   c. Cortex gives hair strength, flexibility, elasticity, and shape (review nature of hair protein).
   d. Chemical bonds in cortex are broken and rearranged during chemical texture services.
      1. Cystine (sulfur bonds) becomes cysteine by reduction; reduction facilitates chemical rearrangement of hair's inner structure.
      2. After hair assumes new shape and form, it must be neutralized to be permanently reformed.
      3. Oxidation and neutralization change cysteine back to cystine state.

B. Principal Actions: see textbook Figures 18-1a to 18-3, textbook Table 18-1, and Supplements 18.0 to 18.2.

1. Permanent waving: physical actions of shampooing, rinsing, and wrapping hair around rods; chemical actions of waving lotion (reduction) and neutralizer (oxidation).
2. Reformation curl: physical actions of combing rearranger through hair, rinsing, and wrapping hair on rods; chemical actions facilitated by the rearranger, waving lotion (booster), and neutralizer.
3. Hair relaxing: physical actions of combing and smoothing relaxing product through hair, shampooing, rinsing, and conditioning; chemical actions provided by ammonium thioglycolate (thio), hydroxide relaxer product, or thio neutralizer; hydroxide products neutralized through physical actions of shampooing and rinsing; broken disulfide bonds cannot be reformed through oxidation.
   a. Ammonium thioglycolate relaxers are stronger than ATG used in permanent waving; most have pH above 10.
   b. Hydroxide relaxers: strong alkalis, not compatible with thio relaxers; have pH up to 13 and sometimes over 13.5.
      1. Hydroxide products break disulfide bonds permanently.
      2. Process known as lanthionization; disulfide bonds are converted to lanthionine bonds when the relaxer is rinsed and hair is at a high pH level.

3. The Client Consultation

A. Overview

1. Determine client's expectations; discuss expectations based on hair type and condition.
2. Ask open-ended questions; example: How did your last permanent wave work out for you?
3. Use visual tools (pictures, magazines, and stylebooks) to ascertain the client's likes and dislikes. Review the following topics that may be discussed during the client consultation.
   a. The desired hairstyle and amount of wave, curl, or straightening desired. Photos or magazine pictures help to make this clear to both the client and the barber.
   b. The client's lifestyle: does he or she have leisure time or a demanding schedule that requires a low-maintenance style?

c. How the hairstyle relates to overall personal image: is the client concerned about current fashion trends?
d. Previous experience: was the last perm satisfactory? If not, what were the problems?

4. Log consultation information on a client record card

B. Scalp and Hair Analysis

1. Analysis follows the client consultation.
2. Determine appropriateness of chemical services and products based on scalp and hair condition.
3. Scalp analysis
   a. Examine for cuts, abrasions, or open sores.
   b. Do not proceed with service if abrasions or signs of scalp disease are present; refer client to a physician as necessary.
4. Hair analysis
   a. Porosity: hair characteristic that helps determine processing time and strength of product.
      1. Resistant: tight cuticle; resists solution penetration and requires higher alkaline solution.
      2. Normal: neither resistant nor overly porous; chemical services usually process as expected.
      3. Porous: raised cuticle, easily absorbs solutions and requires less alkaline solution to minimize swelling or excessive damage to the hair.
      4. Porosity test: Grasp strand of dry hair; hold end with thumb and index finger; use other hand to slide fingers from ends toward the scalp; if hair ruffles up, hair is porous; if no ruffles form, hair is not porous.
   b. Texture: describes the diameter of a single strand of hair; coarse, medium, or fine.
      1. Coarse: usually requires more processing than medium or fine; may also be more resistant.
      2. Medium: most common texture; considered normal and should not create processing problems.
      3. Fine: typically more fragile and easier to process; more susceptible to damage from chemicals.
   c. Elasticity: indicates cross-bond strength; classified as normal or low.
      1. Normal: can stretch up to 50 percent of original length when wet and return without breaking; usually holds curl.
      2. Low: wet hair does not return to original length when stretched; may not hold curl patterns.
      3. Elasticity test: Take a single damp hair strand; hold between thumb and forefinger of each hand. Slowly stretch strand between fingers. Good elasticity: stretches and returns without breakage; poor elasticity: hair breaks easily when stretched (see textbook Figure 18-6).
   d. Density: measures number of hairs per square inch; indicates thickness or thinness of hair.
      1. Helps determine number of blockings or subsections needed.
      2. May also indicate the amount of product needed.
   e. Length: may determine rodding technique in permanent waving or reformation curl services, and amount of product needed.
   f. Growth pattern: hair streams, whorls, and cowlicks influence finished styles; consider when selecting wrapping patterns, rod placement, combing and smoothing direction.

4. Permanent Waving: see textbook Figures 18-7 to 18-49, Procedure 18-1, textbook Tables 18-2 and 18-3, and Supplements 18.3 to 18.5.

A. Overview

1. Two principle actions on hair
   a. Physical: wrapping of hair on perm rods
   b. Chemical: waving solution and neutralizer
2. Performed on freshly shampooed, damp hair; maintain moisture content while rodding.

B. The Perm Wrap

1. Size and shape of curl: determined by the size, shape, type, and method of rodding of the tool used; tools are called *rods.*
   a. Proper selection of rods essential for successful permanent waving.
   b. Concave and straight rods: plastic, vary in diameter and length.
   c. Rod diameter controls curl size.
   d. Elastic band on rod secures placement.
   e. Concave rods: most common type; smaller center diameter; produces tighter curl in center and larger curl on sides of hair parting; used for definite wave pattern close to head.
   f. Straight rods: uniform diameter along length; produces consistently sized wave in hair parting.
   g. Other tools include bender rods or circle tools: wire with foam or plastic covering; uniform-diameter tools; permit bending.
2. End papers or wraps: absorbent papers used for control of hair ends while wrapping or winding.
   a. Book end wrap: uses one paper folded in half over the hair ends.
   b. Single flat or single end wrap: uses one paper placed over top of hair parting.
   c. Double end wrap: uses two end papers, one under and one over hair parting.
3. Sectioning
   a. Hair is sectioned into panels.
   b. Panel size, shape, and direction varies with wrapping pattern and type of tool.
   c. Panels are divided into subsections called base sections.
   d. Base sections should measure almost the same length and width of rod; varies with hair texture, density, and elasticity.
4. Base control: position of perm rod or tool in relation to its base section; determined by angle at which the hair wrapped.
   a. On base: projection is 45 degrees beyond 90 degrees to base section; rod placed on base section; results in volume at scalp area.
   b. Half off-base: angle of 90 degrees to base section; rod placed halfway off base section.
   c. Off base: hair wrapped at 45 degrees below 90 degrees to base section; rod placed off base section; creates least volume.
   d. Base direction: directional pattern in which hair is wrapped, determined by partings and position of rod.
5. Rodding techniques
   a. Croquignole: hair is wound from ends to scalp in overlapping layers.
   b. Spiral: two methods, from ends to scalp or scalp to ends; requires vertical rod positioning while wrapping.

   Activity 1: Have students practice rodding techniques on mannequin using base-control positions.

6. Wrapping methods
   a. Water wrap: rodding the hair in a water-damp condition; most perms wrapped in this manner.
   b. Lotion wrap: wrapping with waving lotion; used on resistant hair with cold waves.
   c. Always check manufacturer's recommendations.

C. Types of Permanent Waves

1. Alkaline perms or cold waves
   a. Main active ingredient and reducing agent: ammonium thioglycolate (ATG).
   b. pH range: generally 9.0 to 9.6 (depends on ammonia content).
   c. Some cold perms wrapped with waving lotion, others with water.
   d. Always follow manufacturer's directions.
   e. Benefits: strong curl pattern, faster processing (5 to 20 minutes), room temperature processing.

2. True acid waves
   a. Main active ingredient: glyceryl monothioglycolate (GMTG).
   b. pH range: 4.5 to 7.0.
   c. Requires hair-dryer heat to process (endothermic perm product).
   d. Benefits: produces softer curl and less damage than cold waves; controllable processing time; used for delicate, fragile, or color-treated hair and style support.
   e. Always follow manufacturer's directions.
3. Acid-balanced waves
   a. Active ingredients: glyceryl monothioglycolate and ammonium thioglycolate.
   b. pH range: 7.8 to 8.2.
   c. Dryer heat not required; heat occurs as result of mixing waving lotion and activator.
   d. Three product components: permanent waving solution (ATG), activator (GMTG), and neutralizer (exothermic perm product).
   e. Process more quickly and produce firmer curls than true acid waves.
   f. Always follow manufacturer's directions.
4. Exothermic waves
   a. Three components: permanent-waving solution, activator, and neutralizer.
   b. Activator contains an oxidizing agent; causes release of heat when mixed with waving solution and shortens processing time.
   c. Always follow manufacturer's directions.
5. Ammonia-free waves
   a. Use alkanolamines to replace ammonia.
   b. pH level: may start at 9.6; drops to 8.2 during processing due to ammonia evaporation.
   c. May maintain pH level through processing time.
   d. Always follow manufacturer's directions.
6. Thio-free waves
   a. Active ingredient: cysteamine or mercaptamine.
   b. May be just as damaging as regular thio formulations.
   c. Always follow manufacturer's directions.
7. Low-pH waves
   a. Active ingredients: sulfates, sulfites, and bisulfites; weak and do not produce firm curl.
   b. Usually marketed as body waves.
   c. Always follow manufacturer's directions.
8. Caution: Accidentally mixing the contents of the activator tube with the neutralizer instead of the permanent waving solution will cause a violent chemical reaction that can cause injury, especially to the eyes.
9. Strengths of waving solutions
   a. pH levels should not exceed 9.6.
   b. Most manufacturers market three or more strengths of permanent waving products:
      1. Mild: for damaged, porous, or tinted hair.
      2. Normal: for normal hair with good porosity.
      3. Resistant: for resistant hair with less porosity.
10. Pre-wraps
   a. Some permanent waving products include pre-wrap lotion; helps to equalize porosity.
   b. Always follow manufacturer's directions.

D. Perm Selection

1. Essential to select proper waving product for hair type and desired result.
2. Perform a client consultation.
   a. Resistant hair: alkaline wave or cold wave perms.
   b. Normal hair: alkaline or acid-balanced perms.
   c. Tinted, highlighted, or delicate hair: acid-balanced or true acid perms.
3. Permanent wave processing and wave formation
   a. Permanent wave product strength based on concentration of reducing agent.
   b. Processing time determined by strength of waving solution and porosity level of the hair.
   c. Most processing takes place within first 5 to 10 minutes.
4. S-pattern: indicates wave-formation peak.
   a. Under-processed hair: limp or weak wave formation, undefined ridges, and inability to hold curl.
   b. Over-processed hair: weak curl formation; curly when wet; frizzy when dry; requires conditioning.
5. Preliminary test curls
   a. Help to determine how hair will react to permanent waving process.
   b. Facilitates observation of speed, peak time, and picture of wave formation; resistant areas; appropriateness of product selection.
   c. Performed by rodding one parting of hair in three areas: the top, side, and nape.
6. Neutralization
   a. Neutralizers: oxidizers that stop permanent wave solution action and harden hair into new form.
   b. Types: hydrogen peroxide, sodium bromate, and sodium perborate.
   c. Functions: deactivates any waving solution remaining in hair after rinsing; rebuilds disulfide bonds broken by waving solution.
   d. Different products may require different procedures; always follow manufacturer's directions.
   e. Insufficient blotting after rinsing may prevent even saturation or may dilute neutralizer.
   f. Application: applied to top and bottom of each rod.
   g. Protect client's eyes with cotton coil or towel; rinse according to manufacturer's directions.
7. Post-perm care
   a. Past recommendation: 48 to 72 hours before shampooing freshly permed hair.
   b. Properly processed perms should stand up to shampooing with a mild, acid-balanced shampoo.
   c. Educate clients about appropriate shampoos and conditioners.
   d. Deposit-only haircolor may be applied sooner than former recommendation of three days after a permanent wave.
   e. Guidelines for clients
      1. Shampoo the hair as needed with an acid-balanced shampoo.
      2. Use a moisturizing hair conditioner.
      3. Schedule regular shop visits for trims and conditioning treatments to maintain the hairstyle.

E. Permanent Waving Wrapping Patterns

1. Basic: all rods positioned in same direction on equal-sized horizontal bases; base control is half off-base.
2. Curvature: one choice for men's styles; follows curve of head.
3. Brick-lay: offset base sections, row by row; prevents noticeable splits; may be preferred for men.
4. Spiral: more a technique than a pattern; uses vertical partings; hair is spiraled on rod.

5. Piggyback: uses two rods for each hair parting; facilitates even curl formation on long hair; first rod is placed midway between scalp and hair ends and rodded; leaves tail of hair; tail is rodded on second rod and positioned on top of first rod.
6. Partial perms: only a section of the hair is permed.
   a. For men, usually top and crest area.
   b. Considerations
      1. To make a smooth transition from rodded to non-rodded sections, use next largest rod size to help blend permed hair with non-permed hair.
      2. Place cotton coil around wrapped rods and hairline.
      3. Apply heavy conditioner to sections not being permed to protect hair from waving lotion.

F. Special Problems

1. Dry, damaged hair: give reconditioning treatments prior to permanent wave service.
2. Tinted or lightened hair
   a. Shampoo with extra-mild shampoo before waving.
   b. May need pre-wrap.
   c. Select waving solutions formulated for tinted/lightened hair.
   d. Perform preliminary test curls.
3. Hair tinted with metallic dye
   a. Treat with dye remover.
   b. Do not wave if test curls break or discolor.
4. Curl reduction
   a. Apply waving solution; gently comb through hair to widen and loosen wave; rinse and neutralize.
   b. Caution: Do not perform curl reduction on over-processed hair.
5. Air-conditioning or heating units may affect processing time; seat clients away from vents.

G. Safety Precautions

1. Always protect client's clothing with the proper waterproof drape.
2. Use two towels: one under the drape and one over the drape.
3. Always examine the client's scalp before a perm service; do not proceed if abrasions present.
4. Do not proceed with perm if client has ever experienced an allergic reaction to products.
5. Do not perm excessively damaged hair or hair that has been treated with hydroxide relaxers.
6. Always apply a protective cream barrier around client's hairline before applying waving solution.
7. Immediately replace cotton coils or towels that have become saturated with solution.
8. Always protect the client's eyes with a towel when applying waving and neutralizing solutions; in case of accidental exposure, rinse eyes thoroughly with cool water.
9. Always follow the manufacturer's directions.
10. Do not dilute or add anything to waving or neutralizing solutions unless specified in the manufacturer's directions.
11. Wear gloves when applying solutions.
12. Do not save opened or unused products; strength and effectiveness changes if not used promptly.
13. Unless otherwise specified in the product instructions, apply waving and neutralizing solutions liberally to the top and underside of each rod.
14. Start at the crown or top and progress systematically down each section; make sure the surface area of the hair is wet with lotion for even penetration.
15. Use same application pattern for neutralizer as used with waving solution to avoid missed rods.
16. Re-saturation requires watching the wave development closely to avoid hair damage.

H. Procedure

1. Preliminary test curl
   a. Shampoo hair and towel dry.
   b. Follow perm directions; wrap two or three rods in most delicate or resistant areas.
   c. Wrap cotton around each rod.
   d. Wear gloves; apply waving lotion; avoid waving lotion contacting unwrapped hair.
   e. Set timer; process according to directions; check curl formation frequently.
2. Procedure
   a. Cut or trim hair before or after perm, depending on length.
   b. Section or sub-section hair
      1. Rod from crown to nape to create a center panel or from crown to front section.
      2. Use panel as a guide for subsequent rod placement.
      3. After center back panel is rodded, rod the back side panels and then the sides (be guided by instructor for options).
   c. Apply protective cream and cotton strips around client's hairline.
   d. Apply waving solution as recommended by manufacturer. Cold wave: check wave formation immediately after saturating hair with solution; take frequent test curls in different areas throughout recommended processing time.
   e. Process for required time.
   f. After curl processing, rinse thoroughly; use gentle water pressure and tepid temperature.
   g. Towel blot excess moisture from rods; do not rock or roll rods while blotting. Follow towel blot with paper towel blotting to remove residual moisture.
   h. Apply neutralizer; process according to manufacturer's neutralization instructions.
   i. Unwind rods and remove them carefully (depending on manufacturer's directions).
   j. Apply remaining neutralizer and work through hair with hands.
   k. Rinse hair thoroughly.
   l. Towel dry and style hair as desired.

   Activity 2: Have students perform permanent wave test curls, rodding, processing, and neutralizing on a mannequin. (Optional: Have students use small-diameter rods for complete permanent wave process, so they can use the same mannequin to perform an actual reformation curl or relaxer procedure.) Note: If a relaxer procedure is to follow, do not allow students to apply a sodium hydroxide relaxer on top of the permanent wave. Use a thio-based relaxer.

5. Reformation Curls: see textbook Procedure 18-2.

A. Overview

1. Also known as a soft-curl permanent.
2. Three-step process used to restructure very curly hair into looser or larger curls.
3. Thio relaxer partially relaxes the hair; thio permanent wave restructures the hair around perm rods; neutralizer rebuilds broken disulfide bonds.

B. Products

1. Thio relaxer product: called rearranger; ammonium thioglycolate in thick cream form.
2. Thio waving solution: called booster; similar to alkaline permanent waving solutions.
3. Neutralizer: oxidizer; clear or milky liquid form; same product line as rearranger and booster.
4. Additional products: activators and moisturizers serve as leave-in conditioners and styling aids and promote curl retention; avoid excess application to prevent drips or over-saturation.

C. Procedure

1. Part hair into four sections; clip hair out of the way.
2. Apply protective base cream around hairline and tops of the ears.

3. Wear gloves; part off ¼" to ½" partings; apply rearranger ¼" to ½" inch from the scalp on the top and underside of the parting with brush, applicator bottle, or back of comb.
4. Continue applying the rearranger until all the sections have been covered.
5. Use back of comb or fingers to smooth and gently pull hair partings into relaxed curl formation.
6. Process according to the manufacturer's directions and rinse thoroughly.
7. Part hair into panels in preparation for rodding; use length of rod to measure panel width.
8. Apply and distribute booster to first panel; rod the hair.
9. Continue wrapping and rodding the remaining panels in the same manner.
10. Place cotton coil around hairline; apply extra booster as necessary for even saturation.
11. If plastic cap used, punch a few holes to release excess heat; position cap rim over cotton.
12. Check cotton and towels. If saturated, replace them.
13. Process according to manufacturer's directions; most take less than 20 minutes at room temperature.
14. Check for proper curl development.
15. When processing is complete, rinse thoroughly for at least 5 minutes. Towel blot each rod to remove excess moisture.
16. Apply neutralizer, set timer, and neutralize according to directions.
17. Remove rods gently; distribute remaining neutralizer through hair ends; rinse thoroughly. Shampoo and condition according to manufacturer's directions.
18. Style the hair as desired.

Activity 3: Have students practice a mock or actual reformation curl on a mannequin.

6. Chemical Hair Relaxing: see textbook Procedure 18-3, textbook Table 18-4, and Supplements 18.6 to 18.8.

A. Overview

1. Process of permanently rearranging extremely curly hair into a straightened form.
2. Shape of the hair is changed by breaking and rearranging disulfide bonds.
3. Basic products: relaxers (straighteners); neutralizers or neutralizing shampoos; protective bases and conditioners.

B. Types of Relaxers

1. Thio: may require pre-relaxing shampooing; neutralized with neutralizing solution.
   a. Same reducing agent used in permanent waving, but stronger; pH of 10.0 or above.
   b. Cream form: thicker consistency than waving lotions.
2. Hydroxide: do not usually allow pre-relaxing shampooing; neutralized with acid-balanced or neutralizing shampoo.
   a. Made of ionic compounds formed by a metal, combined with oxygen and hydrogen.
   b. Examples: sodium hydroxide, potassium hydroxide, lithium hydroxide, and guanidine hydroxide.
   c. Sodium-hydroxide relaxers
      1. Lye relaxers.
      2. Oldest; commonly used.
      3. 5 to 10 percent sodium hydroxide content with pH range of 10 to 14.
      4. Higher percentage of sodium hydroxide causes faster chemical reaction.
      5. Higher pH factor causes greater hair damage or breakage.
   d. Potassium- and lithium-hydroxide relaxers: often sold as "no mix–no lye" relaxers; little difference in chemistry and performance.

e. Guanidine-hydroxide relaxers
   1. Usually advertised as "no lye" relaxers.
   2. Contain two products: relaxer cream and activator.
   3. Recommended for sensitive scalps.

f. Calcium-hydroxide relaxers
   1. Often mistakenly referred to as "no-lye" relaxers.
   2. Require an activator.
   3. Product strength determined by amount of activator used.
   4. Considered mild and work more slowly.
   5. Many professionals feel calcium-hydroxide relaxers to be more damaging to hair.

g. Hydroxide relaxers usually sold in base and no-base formulas.
   1. Base formula: requires application of base cream to scalp prior to relaxer application.
   2. No-base formula: contains a base cream designed to melt at body temperature; does not require application of separate protective base.

h. Chemical relaxers: available in different strengths: usually mild, regular, and super.
   1. Mild: recommended for fine, color-treated, or damaged hair.
   2. Regular: intended for normal hair textures.
   3. Super: used for maximum straightening on extremely curly, coarse hair.

i. Texturizers and chemical blow-outs
   1. Texturizers: relaxing products used to reduce very curly hair to a wave formation for easier styling.
   2. Chemical blow-out: partially straightens hair for a picked-out style or cut such as a 1970s Afro style.
   3. Both services may be performed with thio or sodium hydroxide relaxer; do not over-relax.
   4. Thio relaxers: process for almost entire recommended time for either service.
   5. Sodium hydroxide: process for no more than 40 percent of recommended time.
   6. Apply appropriate neutralizer or neutralizing shampoo and conditioner after either service.

C. Safety Precautions

1. Always protect clients' clothing with the proper waterproof drape.
2. Use two towels, one under the drape and one over the drape.
3. Always examine client's scalp before relaxer service; do not proceed if abrasions present.
4. Do not proceed if client has experienced an allergic reaction to the products.
5. Do not relax excessively damaged hair.
6. Do not use thio relaxers on hair treated with hydroxide relaxers, or vice-versa.
7. Always apply a protective cream barrier around client's hairline before applying the relaxer.
8. Base scalp with a protective cream as directed by the product manufacturer.
9. Always be careful of client's eyes when applying relaxers and neutralizing solutions. In case of accidental exposure, rinse thoroughly with cool water.
10. Always follow the manufacturer's directions.
11. Do not dilute or add anything to relaxer creams unless specified in manufacturer's directions.
12. Wear gloves when applying relaxers.
13. Do not save mixed products; strength and effectiveness changes if not used promptly.
14. Apply relaxer cream to the most resistant area first.
15. Follow same pattern for smoothing the relaxer as was used during the application process.

D. Procedures

1. Relaxer strand test
   a. Thread small section of hair through a hole cut in waxed paper or paper towel.
   b. Apply relaxer to hair section and smooth; process according to directions.

c. Mist hair section with water to remove product and blot; neutralize with appropriate product depending on type of relaxing product used. Check results; note on record card.
d. If test satisfactory, apply conditioner or base cream to strand; isolate it; proceed with service.

2. Thio or hydroxide relaxer virgin application; note: light shampooing before a thio relaxer is optional.
   a. Part the hair into four sections; secure hair sections with a clip.
   b. Apply protective base cream around hairline and tops of the ears. Take ¼" to ½" partings and apply base cream along each parting.
   c. Wear gloves. Part off ¼" to ½" partings and apply the relaxer ¼" to ½" from the scalp on the top and underside of the parting. Do not apply relaxer to the scalp area or porous ends at this time. Use brush, applicator bottle, or back of comb.
   d. Continue applying the relaxer until all the sections have been covered.
   e. Use back of comb or fingers to smooth the hair and gently pull partings into a straighter form.
   f. Process according to manufacturer's directions. During the last few minutes of processing, work the relaxer down to the scalp and through the ends of the hair. Carefully comb and smooth all sections.
   g. Rinse thoroughly to remove all traces of the relaxer.
3. Retouch Application
   a. Part hair into four sections; clip hair out of the way.
   b. Apply protective base cream around hairline/tops of the ears. Take ¼" to ½" partings and apply base cream along each parting.
   c. Wear gloves. Part off ¼" to ½" partings; apply relaxer ¼" to ½" from the scalp on the top and underside of the new growth. Do not apply relaxer to scalp area at this time. Do not overlap the relaxer onto previously relaxed hair.
   d. Continue applying the relaxer until all the sections have been covered.
   e. Use back of the comb or fingers to smooth and straighten the new growth area.
   f. Process according to manufacturer's directions. During the last few minutes of processing, work the relaxer down to the scalp.
   g. Rinse thoroughly to remove all traces of the relaxer.
4. Neutralization procedures
   a. Thio relaxer: Apply normalizing or neutralizing solution and comb through to ends; process and rinse thoroughly; follow directions for shampooing and conditioning.
   b. Hydroxide relaxer: Shampoo at least three times with neutralizing shampoo or recommended product. Rinse thoroughly and condition according to manufacturer's directions. Style as desired.

   Activity 4: Have students practice mock or actual relaxer and relaxer-retouch applications on a mannequin.

SUMMARY/REVIEW: What did we learn and do today?

1. Discussed and explained the effects of chemical texture services on the hair.
2. Discussed the similarities and differences in products used for chemical services.
3. Discussed hair and scalp analysis prior to chemical texture services.
4. Identified and discussed products used for chemical texture services.
5. Demonstrated a permanent wave service (instructor).
6. Practiced permanent wave sectioning and rodding; performed a permanent wave procedure (students).
7. Demonstrated a reformation curl service (instructor).
8. Practiced a reformation curl service; performed a reformation curl procedure (students).
9. Demonstrated virgin and retouch relaxer applications (instructor).
10. Practiced virgin and retouch relaxer applications; performed virgin and retouch relaxer applications (students).

THEORY REVIEW QUESTIONS AND ANSWERS

1. What are the physical and chemical changes that occur in the hair as a result of chemical texture services?

   Answer: Chemical texture services create permanent changes in the structure and appearance of the hair. Physical bonds are broken by shampooing and rinsing; chemical bonds are broken or rearranged through chemical applications used in permanent waving, reformation curls, and chemical hair relaxers. Alkaline substances used in these processes create a chemical action that breaks chemical bonds and allows for softening and expansion of the hair. Cystine bonds are altered to cysteine during reduction; this allows for the chemical rearrangement of the hair's inner structure so that it can assume a new shape or form. Next, the hair is neutralized so hydrogen and sulfur cross-bonds in the cortex are permanently reformed. Cysteine is changed back to the cystine state during the process of oxidation and neutralization, which hardens the S-bonds of the hair into the newly constructed form.

2. What characteristics of the hair and scalp are used in an analysis for chemical texture services, and what do the characteristics indicate or tell us about the hair?

   Answer: *Scalp analysis:* examine for cuts, abrasions, or open sores. *Hair analysis:*

   (1) porosity: the ability of the hair to absorb moisture; resistant, normal, or porous; (2) texture: describes the diameter of a single strand of hair; coarse, medium, or fine; (3) elasticity: ability of wet hair to stretch and return to original length without breaking; (4) density: measures the number of hairs per square inch of scalp and indicates the thickness of hair; thick, medium, or thin; (5) length: may help to determine the rodding technique to use or the amount of product needed; (6) growth pattern: hair streams, whorls, and cowlicks can influence finished styles.

3. What are some similarities and differences between permanent wave, reformation curl, and hair relaxing procedures?

   Answer: All three processes create permanent changes in the hair structure and original shape, all require physical and chemical actions, and all must be neutralized in some way after processing.

   a. The permanent wave process requires the physical actions of shampooing, rinsing, and wrapping the hair around rods. The chemical actions take place when a waving lotion and neutralizer produce permanent physical and chemical changes in the hair.
   b. The reformation curl process requires the physical actions of combing or smoothing a chemical rearranger through the hair for partial relaxation of the natural curl, rinsing, and wrapping the hair on rods. The chemical actions used to produce permanent changes in the hair are facilitated by the rearranger, waving lotion (booster), and neutralizer.
   c. The hair relaxing process requires the physical actions of combing or smoothing the relaxing product through the hair, shampooing, rinsing, and conditioning. Chemical action occurs as a result of the relaxer product used to straighten the hair, but thio relaxers also require the use of a neutralizer to chemically oxidize the hair. Hydroxide relaxing products are neutralized through the physical actions of shampooing and rinsing with appropriate shampoo.

4. What are the primary steps involved in permanent waving?

   Answer: Shampooing, rodding, processing, neutralizing, and conditioning

5. What are some safety precautions used in permanent waving?

   Answer: Any of the following:

   a. Always protect client's clothing with a proper waterproof drape.
   b. Use two towels, one under the drape and one over the drape.
   c. Always examine the client's scalp before a perm service. Do not proceed if abrasions are present.
   d. Do not proceed with the perm if the client has ever experienced an allergic reaction to the products.
   e. Do not perm excessively damaged hair or hair that has been treated with hydroxide relaxers.

f. Always apply a protective cream barrier around the client's hairline before applying the waving solution.
g. Immediately replace cotton coils or towels that have become saturated with solution.
h. Always protect the client's eyes when applying waving and neutralizing solutions by providing the client with a clean towel to hold over his or her eyes during the application. In case of accidental exposure, rinse thoroughly with cool water.
i. Always follow the manufacturer's directions.
j. Do not dilute or add anything to waving or neutralizing solutions unless specified in the manufacturer's directions.
k. Wear gloves when applying solutions.
l. Do not save opened or unused products as the strength and effectiveness will change if not used promptly.
m. Unless otherwise specified in the product instructions, apply waving and neutralizing solutions liberally to the top and underside of each rod.
n. Start at the crown and progress systematically down each section.
o. Follow the same application pattern for the neutralizer as used with the waving solution to avoid missing any rods.
p. Re-saturate as necessary, but watch wave development closely.

6. What are the primary steps involved in the reformation-curl service?
Answer: Rearranging, rodding, processing, neutralizing, and conditioning
7. What are the primary steps involved in relaxing with thio relaxers?
Answer: Shampooing (depending on product), relaxing and smoothing (processing), neutralizing, and conditioning
8. What are the primary steps involved in relaxing with hydroxide relaxers?
Answer: Relaxing and smoothing (processing), neutralizing shampoo, and conditioning
9. What is the difference between a base and no-base relaxer?
Answer: Base relaxers require a basing product to protect the scalp; no-base relaxers contain a base cream.
10. Which chemical texture services require or may require a pre-service shampoo?
Answer: Permanent waves, reformation curls, and some thio relaxers
11. What is the difference between a texturizer and a chemical blow-out?
Answer: A texturizer is usually used to loosen the curl into a wave formation for easier styling; a chemical blow-out retains more curl but is picked out and cut into shape to create short or long Afro-type styles.
12. What are some safety precautions used in chemical hair relaxing?
Answer: Any of the following:
    a. Always protect client's clothing with the proper waterproof drape.
    b. Use two towels, one under the drape and one over the drape.
    c. Always examine the client's scalp before a relaxer service. Do not proceed if abrasions are present.
    d. Do not proceed if the client has ever experienced an allergic reaction to the products.
    e. Do not relax excessively damaged hair.
    f. Do not use thio relaxers on hair that has been treated with hydroxide relaxers.
    g. Always apply a protective cream barrier around the client's hairline before applying the relaxer.
    h. Base the scalp with a protective cream as directed by the product manufacturer.
    i. Always be careful of the client's eyes when applying relaxers and neutralizing solutions. In case of accidental exposure, rinse thoroughly with cool water.
    j. Always follow the manufacturer's directions.

k. Do not dilute or add anything to relaxer creams unless specified in the manufacturer's directions.
l. Wear gloves when applying relaxers.
m. Do not save mixed products as the strength and effectiveness will change if not used promptly.
n. Apply relaxer cream to the most resistant area first.
o. Follow the same pattern for smoothing the relaxer as was used during the application process.

ASSIGNMENTS

1. Read Chapter 19: Haircoloring and Lightening (if required in the barbering curriculum).
2. Begin Workbook Chapter 19: Haircoloring and Lightening; due date: _____.

Textbook Chapter Review Questions and Answers

Chapter 18: Chemical Texture Services

1. Explain the physical and chemical changes that occur in the hair as a result of chemical texture services.

   Chemical texture services create permanent changes in the structure and appearance of the hair. Physical bonds are broken by shampooing and rinsing; chemical bonds are broken or rearranged through chemical applications used in permanent waving, reformation curls, and chemical hair relaxers. Alkaline substances used in these processes create a chemical action that breaks chemical bonds and allows for softening and expansion of the hair. Cystine bonds are altered to cysteine during reduction; this allows for the chemical rearrangement of the hair's inner structure so that it can assume a new shape or form. Next, the hair is neutralized so hydrogen and sulfur cross-bonds in the cortex are permanently re-formed. Cysteine is changed back to the cystine state during the process of oxidation and neutralization, which hardens the S bonds of the hair into the newly constructed form.

2. What characteristics or condition of the hair and scalp should be analyzed before performing chemical texture services?

   1. Scalp analysis: examine for cuts, abrasions, or open sores.

   2. Hair analysis:

   a) Porosity is the ability of the hair to absorb moisture; hair can be resistant, normal, or porous.

   b) Texture describes the diameter of a single strand of hair: coarse, medium, or fine.

   c) Elasticity is ability of wet hair to stretch and return to original length without breaking.

   d) Density measures the number of hairs per square inch of scalp and indicates the thickness of hair: thick, medium, or thin.

   e) Length may help to determine the rodding technique to use or the amount of product needed.

   f) Growth patterns include hair streams, whorls, and cowlicks, which can influence finished styles.

3. List the similarities and differences between permanent wave, reformation curl, and hair relaxing processes.

   All three processes create permanent changes in the hair structure and original shape; all require physical and chemical actions; and all must be neutralized in some way after processing.

   1. The permanent wave process requires the physical actions of shampooing, rinsing, and wrapping the hair around rods. The chemical actions take place when a waving lotion and neutralizer produce permanent physical and chemical changes in the hair.

   2. The reformation curl process requires the physical actions of combing a chemical rearranger through the hair for partial relaxation of the natural curl, rinsing, and wrapping the hair on rods. The chemical actions used to produce permanent changes in the hair are facilitated by the rearranger, waving lotion (booster), and neutralizer.

   3. The hair relaxing process requires the physical actions of combing or smoothing the relaxing product through the hair, shampooing, rinsing, and conditioning. Chemical action occurs as a result of the relaxer product used to straighten the hair, but thio relaxers also require the use of a neutralizer to chemically oxidize the hair. Hydroxide relaxing products are neutralized through the physical actions of the shampooing and rinsing with appropriate shampoo.

4. List the chemical products used in permanent waving.

   Waving lotions, neutralizers, and sometimes activators

5. List at least five permanent waving safety precautions.

   Any of the following:

   a) Always protect clients' clothing with the proper waterproof drape.

   b) Use two towels, one under the drape and one over the drape.

   c) Always examine the client's scalp before a perm service. Do not proceed if abrasions are present.

   d) Do not proceed with a perm if the client has ever experienced an allergic reaction to the products.

   e) Do not perm excessively damaged hair or hair that has been treated with hydroxide relaxers.

   f) Always apply a protective cream barrier around the client's hairline before applying the waving solution.

   g) Immediately replace cotton coils or towels that have become saturated with solution.

   h) Always protect the client's eyes when applying waving and neutralizing solutions by providing the client with a clean towel to hold over the eyes during the application. In case of accidental exposure, rinse thoroughly with cool water.

   i) Always follow the manufacturer's directions.

   j) Do not dilute or add anything to waving or neutralizing solutions unless specified in the manufacturer's directions.

   k) Wear gloves when applying solutions.

   l) Do not save opened or unused products, as the strength and effectiveness will change if not used promptly.

   m) Unless otherwise specified in the product instructions, apply waving and neutralizing solutions liberally to the top and underside of each rod.

   n) Start at the crown and progress systematically down each section. (Some barbers prefer to start at the top of head.) Be sure that the surface area of the wound hair is wet with lotion to promote even penetration.

   o) Follow the same application pattern for the neutralizer as used with the waving solution to avoid missing any rods.

   p) Sometimes it is necessary to re-saturate the rods during processing. This may be due to evaporation of the solution, dryness of the hair, hair that was poorly saturated the first time, improper selection of solution strength, or failure to follow manufacturer's directions. Reapplying the solution will hasten processing, so watch the wave development closely as negligence may result in hair damage.

6. List the chemical products used in the reformation curl service.

   Rearrangers, boosters, and neutralizers.

7. List the chemical products used with thio relaxers.

   Relaxer product and neutralizer

8. List the products used with hydroxide relaxers.

   Relaxer product, neutralizing or normalizing shampoo, and conditioner

9. Explain the difference between base and no-base relaxers.

   Base relaxers require a basing product to protect the scalp; no-base relaxers contain a base cream.

10. What chemical texture service requires a pre-service shampoo? Which services do not?

    Permanent waves require pre-shampooing; reformation curls and relaxers do not.

11. Explain the difference between a texturizer and a chemical blow-out.

    A texturizer is usually used to loosen the curl into a wave formation for easier styling. A chemical blow-out retains more curl but is picked out and cut into shape to create the Afro style.

12. List at least five chemical hair relaxing safety precautions.

    Any of the following:

    a) Always protect clients' clothing with the proper waterproof drape.

    b) Use two towels, one under the drape and one over the drape.

    c) Always examine the client's scalp before a relaxer service. Do not proceed if abrasions are present.

    d) Do not proceed if the client has ever experienced an allergic reaction to the products.

    e) Do not relax excessively damaged hair.

    f) Do not use thio relaxers on hair that has been treated with hydroxide relaxers.

    g) Always apply a protective cream barrier around the client's hairline before applying the relaxer.

    h) Base the scalp with a protective cream, as directed by the product manufacturer.

    i) Always be careful of the client's eyes when applying relaxers and neutralizing solutions. In case of accidental exposure, rinse thoroughly with cool water.

    Always follow the manufacturer's directions.

    j) Do not dilute or add anything to relaxer creams unless specified in the manufacturer's directions.

    k) Wear gloves when applying relaxers.

    l) Do not save mixed products, as the strength and effectiveness will change if not used promptly.

    m) Apply relaxer cream to the most resistant area first.

    n) Follow the same pattern for smoothing the relaxer as was used during the application process.

Test—Chapter 18

CHEMICAL TEXTURE SERVICES

Read each statement carefully. Circle the letter that correctly completes each of the following statements.

1. Chemical texture services create chemical changes in the hair that are:
   a) temporary
   b) permanent
   c) occasional
   d) neither a, b, nor c
2. Chemical texture services include all of the following *except*:
   a) reformation curls
   b) hair relaxing
   c) permanent waving
   d) haircoloring
3. To maintain the altered texture and structure of the hair when new hair growth occurs, chemical services require:
   a) redo services
   b) reverting services
   c) retouch services
   d) reaction services
4. The process used to chemically restructure straight hair into a wave or curl pattern is:
   a) permanent waving
   b) haircoloring
   c) reformation curls
   d) hair relaxing
5. Permanent waving requires the use of all of the following *except*:
   a) rods
   b) neutralizer
   c) a waving lotion
   d) rearranger
6. A reformation curl is also known as all of the following *except* a:
   a) chemical blow-out
   b) Jheri curl
   c) soft-curl perm
   d) curl
7. A relaxing product that is used to partially straighten the hair is required for a:
   a) permanent wave service
   b) haircolor service
   c) reformation curl service
   d) chemical hair relaxing service
8. The process used to chemically restructure curly hair into a larger curl pattern is called a:
   a) reformation curl
   b) roller set
   c) permanent wave
   d) hair relaxing procedure
9. The process used to rearrange over-curly hair into a straightened hair form is known as:
   a) a permanent wave
   b) a curl
   c) a reformation curl
   d) chemical hair relaxing
10. The two layers of the hair most affected by chemical texture services are the:
    a) cortex and medulla
    b) cortex and cuticle
    c) medulla and cuticle
    d) cortex and hair root

11. The degree to which hair is resistant to chemical changes depends on the strength of the:
    a) cuticle
    b) cortex
    c) hair root
    d) medulla
12. Alkaline solutions used in chemical texture services soften and swell the:
    a) medulla
    b) cuticle
    c) cortex
    d) hair follicle
13. The softening and swelling caused by alkaline solutions allows penetration into the:
    a) medulla
    b) hair follicle
    c) hair root
    d) cortex
14. The hair's strength, flexibility, elasticity, and shape is found in the:
    a) medulla
    b) cuticle
    c) cortex
    d) hair follicle
15. Chemical bonds in the hair are broken or rearranged by:
    a) physical changes
    b) roller setting
    c) chemical services and processes
    d) blow-drying
16. Cysteine is an amino acid created by:
    a) the reduction of cystine
    b) the reduction of hydrogen bonds
    c) physical processes
    d) the reduction of salt bonds
17. Cysteine is changed back to the cystine state during the process of oxidation and:
    a) processing
    b) neutralization
    c) reduction
    d) softening and swelling
18. The two principal actions on the hair during a chemical texture service are:
    a) softening and hardening
    b) swelling and constricting
    c) expansion and contraction
    d) physical and chemical
19. The physical actions involved in permanent waving include all of the following *except*:
    a) shampooing
    b) neutralizing
    c) rinsing
    d) rodding
20. Chemical actions take place within a permanent wave process during:
    a) processing
    b) neutralizing
    c) rearranging
    d) a and b
21. In permanent waving, the waving lotion is also known as a/an:
    a) neutralizer
    b) developer
    c) reducing agent
    d) oxidizer
22. Neutralizers re-bond rearranged disulfide bonds through a process known as:
    a) oxidation
    b) processing
    c) reducing
    d) pH balancing

23. The reformation curl service requires all of the following physical actions *except*:
    a) shampooing
    b) smoothing rearranger
    c) combing
    d) rodding
24. Chemical actions involved in a reformation curl are caused by all of the following except the:
    a) rearranger
    b) neutralizer
    c) booster
    d) leave-in conditioner
25. The primary difference between the waving lotion and the rearranger used in a reformation curl is a matter of:
    a) color
    b) cost
    c) consistency
    d) compatibility
26. Rearrangers are:
    a) thinner than waving lotions
    b) thicker than waving lotions
    c) more translucent than waving lotions
    d) the same consistency as waving lotions
27. The neutralizing process for a reformation curl is:
    a) different than permanent waving
    b) the same as permanent waving
    c) the same as a relaxer
    d) the same as a hydroxide relaxer
28. The hair-relaxing process requires the physical actions of all of the following *except*:
    a) combing and smoothing
    b) shampooing and rinsing
    c) rodding
    d) conditioning
29. The primary chemical action that occurs in hair relaxing is the result of the:
    a) relaxing product
    b) shampoo
    c) combing
    d) conditioner
30. Hydroxide relaxing products are neutralized through the process of:
    a) oxidizing
    b) neutralization
    c) shampooing and rinsing
    d) conditioning
31. Hydroxide relaxers and thio relaxers are:
    a) compatible
    b) not compatible
    c) interchangeable
    d) the same
32. The permanent breaking of disulfide bonds with a hydroxide relaxer is called:
    a) oxidation
    b) lanthionization
    c) neutralization
    d) reduction
33. Ammonium thioglycolate relaxers use an oxidizing agent such as:
    a) water
    b) pre-wrap lotion
    c) waving lotion
    d) hydrogen peroxide

34. Disulfide bonds broken by a hydroxide relaxer:
    a) cannot be reformed
    b) can be bonded
    c) are temporarily rearranged
    d) are repairable
35. Before proceeding with any chemical service, the barber must determine the:
    a) client's expectations
    b) hair type and its condition
    c) degree to which expectations can be met
    d) a, b, and c
36. Information learned during the consultation should be recorded on or in a/an:
    a) appointment book
    b) log book
    c) client record card
    d) client list
37. A chemical service should not be given if the scalp shows signs of:
    a) cuts
    b) abrasions
    c) lesions
    d) a, b, or c
38. A chemical service should not be given if the hair shows signs of:
    a) porosity
    b) elasticity
    c) over-porosity and breakage
    d) non-porosity
39. Hair with a tight, compact cuticle layer is considered to be:
    a) resistant
    b) normal porosity
    c) porous
    d) over-porous
40. Hair that has a raised cuticle layer that easily absorbs solutions is considered to be:
    a) resistant
    b) normal porosity
    c) porous
    d) over-porous
41. Sliding the fingers along a strand of hair from the ends to the scalp is called a:
    a) strand test
    b) pull test
    c) relaxer test
    d) porosity test
42. Hair analysis for chemical texture services includes the hair's porosity, texture, and:
    a) direction of hair growth
    b) density
    c) length
    d) a, b, and c
43. Hair texture describes the diameter of a stand of hair as being any one of the following *except*:
    a) fine
    b) thick
    c) coarse
    d) medium
44. The hair's elasticity is an indication of the strength of its:
    a) medulla
    b) cuticle
    c) cross bonds
    d) diameter
45. Hair density is analyzed to determine the thickness of subsections, the size of rods, and the:
    a) amount of product to use
    b) elasticity of the hair
    c) porosity level of the hair
    d) texture of the hair

46. The two principal actions involved in permanent waving are:
    a) rodding and wrapping
    b) physical and chemical
    c) shampooing and rinsing
    d) neither a, b, nor c
47. In permanent waving, wrapping the hair around the rods is a/an:
    a) optional action
    b) unnecessary action
    c) chemical action
    d) physical action
48. The two chemical actions that take place in permanent waving are:
    a) rodding and wrapping
    b) physical and chemical
    c) processing and neutralizing
    d) shampooing and rinsing
49. The size of the perm rod determines the size of the:
    a) curl or wave
    b) end paper
    c) solution bottle
    d) comb used
50. *Concave*, *straight*, *bender*, and *loop* refer to types of:
    a) end wraps
    b) rollers
    c) perm rods
    d) hair clips
51. Absorbent papers that are used to control the ends of the hair while rodding are called:
    a) end wraps
    b) end papers
    c) neither a nor b
    d) a and b
52. Common end paper-wrapping techniques include all of the following *except* the:
    a) bookend wrap
    b) double end wrap
    c) single flat or single end wrap
    d) double bookend wrap
53. A parting taken from the subsection that is rodded or wrapped is called:
    a) base section
    b) parting
    c) section
    d) working panel
54. The position of the perm rod or tool in relation to its base section is called the:
    a) base section
    b) section
    c) base control
    d) working panel
55. The hair is projected about 45 degrees beyond 90 degrees to its base section in a/an:
    a) off-base rod placement
    b) on-base rod placement
    c) half-base rod placement
    d) any rod placement
56. Wrapping the hair at an angle of 90 degrees to its base section results in:
    a) off-base rod placement
    b) on-base rod placement
    c) half-base rod placement
    d) quarter-off rod placement
57. Rodding the hair at a 45 degree angle below 90 degrees to its base section produces:
    a) off-base rod placement
    b) on-base rod placement
    c) half-base rod placement
    d) any rod placement

58. The directional pattern in which the hair is rodded or wrapped is called the:
    a) base point
    b) base pattern
    c) base section
    d) base direction
59. Two basic methods used to wrap the hair around the perm rod are the:
    a) croquignole and spiral
    b) basic and croquignole
    c) spiral and underhand
    d) overhand and spiral
60. The standard method used to wind the hair from the ends toward the scalp is the:
    a) basic method
    b) croquignole method
    c) overhand method
    d) underhand method
61. Two wrapping methods used in permanent waving are the:
    a) setting lotion wrap and water wrap
    b) neutralizer wrap and water wrap
    c) lotion wrap and water wrap
    d) conditioner wrap and water wrap
62. The application of waving solution to a section of hair just prior to rodding is called a:
    a) water wrap
    b) neutralizer wrap
    c) lotion wrap
    d) conditioner wrap
63. Characteristics of the lotion wrap include all of the following *except* that it:
    a) pre-softens the hair
    b) is used with cold waves
    c) is used on resistant hair types
    d) is used to slow the processing action
64. The main active ingredient in alkaline waves is:
    a) glyceryl monothioglycolate
    b) ammonium thioglycolate
    c) calcium hydroxide
    d) sodium hydroxide
65. The pH range of alkaline waving lotions is generally:
    a) 7.0 to 7.6
    b) 8.0 to 8.6
    c) 9.0 to 9.6
    d) 10.0 to 10.6
66. Characteristics of alkaline waving lotions include all of the following *except* that they:
    a) cause hair shaft shrinkage
    b) lift the cuticle layer
    c) cause hair shaft swelling
    d) cause hair softening
67. Benefits associated with alkaline perms include all of the following *except*:
    a) strong curl patterns
    b) room temperature processing
    c) faster processing time
    d) slower processing time
68. Alkaline perms are generally used on hair that is considered to be:
    a) fragile
    b) resistant
    c) delicate
    d) color treated
69. True acid waves have a pH range of:
    a) 2.5 to 7.0
    b) 3.5 to 7.5
    c) 4.5 to 7.0
    d) 7.0 to 8.5

70. The primary reducing agent in true acid waves is:
    a) glyceryl monothioglycolate
    b) ammonium thioglycolate
    c) calcium hydroxide
    d) sodium hydroxide
71. Characteristics associated with true acid waves include all of the following *except*:
    a) strong curl patterns
    b) less damage than alkaline
    c) soft curl patterns
    d) may require dryer heat
72. A perm product requiring the use a heat source to activate chemical reactions is called:
    a) exothermic
    b) endothermic
    c) neutral
    d) neither a, b, nor c
73. True acid perms should be used when permanent waving any of the following *except*:
    a) delicate hair
    b) fragile hair
    c) color-treated hair
    d) resistant hair
74. Most acid-balanced waving lotions have a pH range of:
    a) 6.5 to 7.0
    b) 4.5 to 7.5
    c) 7.8 to 8.2
    d) 8.5 to 9.5
75. The active ingredients in acid-balanced waving lotions are:
    a) AGT and GTMG
    b) ATG and GMTG
    c) ATM and GTO
    d) ATG and ATM
76. Components of exothermic perms include the waving solution and the:
    a) activator and neutralizer
    b) activator and conditioner
    c) neutralizer and conditioner
    d) reducing agent and neutralizer
77. The active ingredients used in ammonia-free waves are:
    a) acids
    b) hydroxides
    c) alkanolamines
    d) oxides
78. Characteristics of alkanolamines include all of the following *except*:
    a) slow evaporation
    b) quick evaporation
    c) little to no odor
    d) consistent pH level during processing
79. Accidentally mixing the contents of the activator tube with the neutralizer will cause:
    a) a violent chemical reaction
    b) neutralization
    c) no chemical reaction
    d) reduction
80. The primary reducing agents used in thio-free waves are cysteamine or:
    a) alkanolamines
    b) ammonium thioglycolate
    c) hydroxides
    d) mercaptamine
81. Characteristics of low-pH waves include all of the following *except* that they:
    a) contain sulfates, sulfites, and bisulfites
    b) do not produce a firm curl
    c) contain ATG
    d) are usually marketed as body waves

82. The usual strengths of permanent waving products include all of the following *except*:
    a) mild
    b) resistant
    c) normal
    d) super
83. Most pre-wraps are:
    a) leave-in conditioners
    b) neutralizers
    c) waving lotions
    d) activators
84. Most of the processing of a permanent wave takes place within:
    a) the first minute
    b) the first 5 minutes
    c) 5 to 10 minutes
    d) 10 to 20 minutes
85. Wave processing has reached its peak when it forms a firm:
    a) spiral shape
    b) letter S shape
    c) ridged shape
    d) letter C shape
86. Limp or weak wave formation is a sign of:
    a) over-processing
    b) under-processing
    c) curl formation
    d) optimum processing
87. Frizziness is an indication of:
    a) over-processing
    b) under-processing
    c) curl formation
    d) optimum processing
88. To determine how the client's hair will react to the permanent waving process, perform a:
    a) strand test
    b) color test
    c) patch test
    d) test curl
89. Two functions of a neutralizer are to deactivate remaining waving lotion in the hair and to:
    a) rebuild disulfide bonds
    b) expand the cuticle
    c) soften disulfide bonds
    d) soften the cuticle
90. Permanently waved hair should be shampooed with:
    a) alkaline shampoos
    b) acid-balanced shampoos
    c) clarifying shampoos
    d) medicated shampoos
91. Three components of a soft-curl perm are the waving lotion and the:
    a) neutralizer and water
    b) rearranger and conditioner
    c) rearranger and neutralizer
    d) booster and water
92. Chemically rearranging extremely curly hair into a straightened form is called:
    a) permanent waving
    b) chemical hair relaxing
    c) soft-curl perming
    d) reformation curling
93. The basic products used in the chemical hair-relaxing process include all of the following *except*:
    a) waving lotion
    b) neutralizing shampoo
    c) relaxer cream
    d) conditioner

94. Two of the most common types of relaxers are:
    a) acid and hydroxide relaxers
    b) thio and hydroxide relaxers
    c) acid and thio relaxers
    d) hydroxide and sodium relaxers
95. The type of relaxer product that requires a chemical neutralizing solution is the:
    a) acid relaxer
    b) sodium relaxer
    c) thio relaxer
    d) hydroxide relaxer
96. Characteristics of sodium hydroxide relaxers include all of the following *except* that they:
    a) are known as lye relaxers
    b) have a pH range of 8.0 to 10.0
    c) have a pH range of 10 to 14
    d) are the oldest and most used
97. Characteristics of guanidine hydroxide relaxers include all of the following *except* that they:
    a) are known as no-lye relaxers
    b) do not require mixing
    c) require mixing
    d) are recommended for sensitive scalps
98. Characteristics of calcium hydroxide relaxers include all of the following *except* that they:
    a) are very gentle on hair
    b) are considered mild
    c) require an activator
    d) work slowly on the hair
99. Base and no-base formulas refer to:
    a) thio relaxers
    b) reformation curls
    c) hydroxide relaxers
    d) soft-curl perms
100. Texturizers and chemical blow-outs are used to:
    a) curl hair
    b) partially straighten hair
    c) straighten hair
    d) flat iron hair

Answer Key—Chapter 18

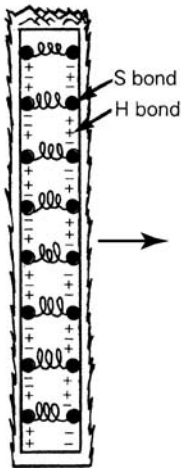
CHEMICAL TEXTURE SERVICES

1. b
2. d
3. c
4. a
5. d
6. a
7. c
8. a
9. d
10. b
11. a
12. b
13. d
14. c
15. c
16. a
17. b
18. d
19. b
20. d
21. c
22. a
23. a
24. d
25. c
26. b
27. b
28. c
29. a
30. c
31. b
32. b
33. d
34. a
35. d
36. c
37. d
38. c
39. a
40. c
41. d
42. d
43. b
44. c
45. a
46. b
47. d
48. c
49. a
50. c
51. d
52. d
53. a
54. c
55. b
56. c
57. a
58. d
59. a
60. b
61. c
62. c
63. d
64. b
65. c
66. a
67. d
68. b
69. c
70. a
71. a
72. b
73. d
74. c
75. b
76. a
77. c
78. b
79. a
80. d
81. c
82. d
83. a
84. c
85. b
86. b
87. a
88. d
89. a
90. b
91. c
92. b
93. a
94. b
95. c
96. b
97. b
98. a
99. c
100. b

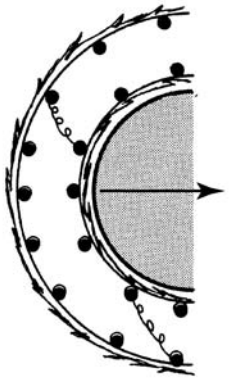
Supplement 18.0

CHANGES IN HAIR CORTEX DURING PERMANENT WAVING

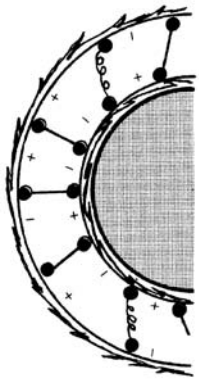
1. **Straight Hair**
(Both H and S bonds in straight positions.)



2. **Hair Wound on Rods and Softened by Shampooing and Cold Wave Solutions.**
(H bonds and nearly all S bonds broken.)

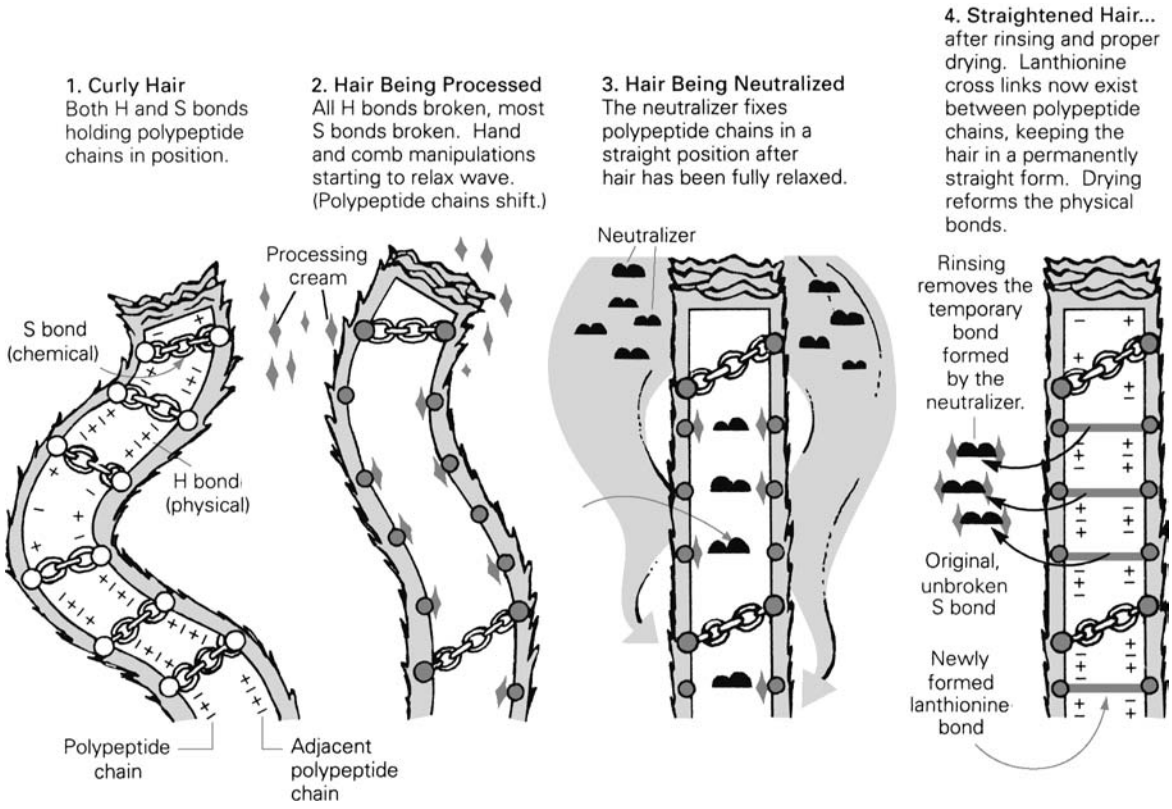


3. **Hair After Neutralizing.**
(Some H Bonds and many S bonds reformed.)



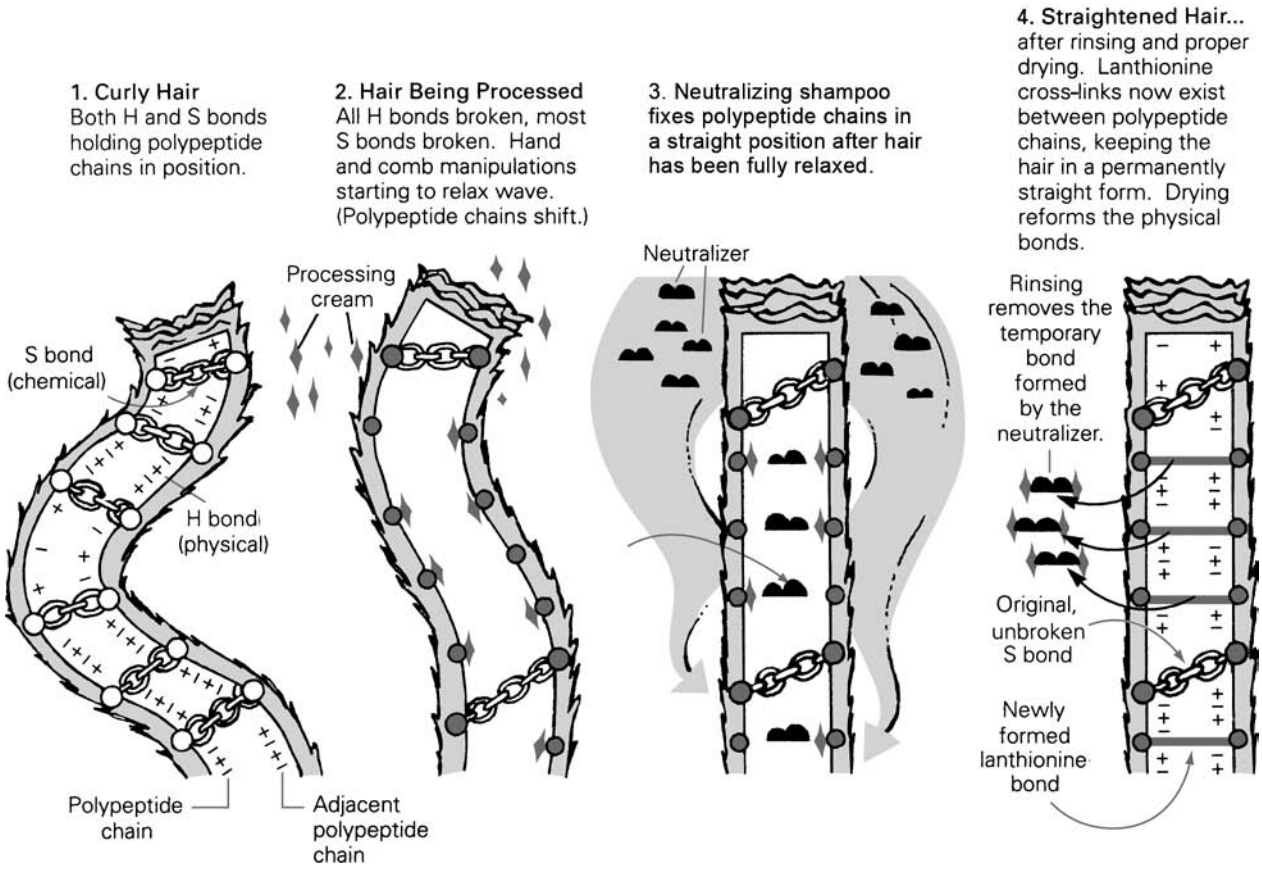
Supplement 18.1

CHANGES IN HAIR DURING CHEMICAL HAIR STRAIGHTENING WITH AMMONIUM THIOGLYCOLATE



Supplement 18.2

CORTEX DURING CHEMICAL HAIR STRAIGHTENING WITH SODIUM HYDROXIDE



Supplement 18.3

PERMANENT WAVING PRODUCT SELECTION

Perm Type	Active Ingredient	Wrapping Method	Process	Recommended Hair Type	Results	Advantages	Disadvantages
alkaline/cold wave pH: 9.0 to 9.6	ammonium thioglycolate (ATG)	lotion wrap or water wrap	room temperature	coarse, thick, or resistant	firm, strong curls	processes quickly at room temperature	unpleasant ammonia odor; may damage delicate hair
exothermic wave pH: 9.0 to 9.6	ammonium thioglycolate (ATG)	water wrap	exothermic	coarse, thick, or resistant	firm, strong curls	faster processing time	unpleasant ammonia odor; may damage delicate hair
true acid wave pH: 4.5 to 7.0	glyceryl monothioglycolate (GMTG)	water wrap	endothermic	extremely porous or very damaged hair	soft, weak curls	low pH produces minimal swelling	requires heat from hair dryer; will not produce firm, strong curls
acid-balanced wave pH: 7.8 to 8.2	glyceryl monothioglycolate (GMTG)	water wrap	room temperature	normal, porous, or damaged hair	soft curls	minimal swelling; processes at room temperature	repeated exposure may cause allergic sensitivity in clients and stylists
ammonia-free wave pH: 7.0 to 9.6	monoethanolamine (MEA)/ aminomethylpropanol (AMP)	water wrap	room temperature	porous to normal	medium to fine curls	no unpleasant ammonia odor	overall strength varies with different manufacturers
thio-free wave pH: 8.0 to 9.6	mercaptamine/ cysteamine	water wrap	room temperature	porous to normal	medium to fine curls	may be gentler, depending on formula	overall strength varies with different manufacturers
low-pH waves pH: 6.5 to 7.0	ammonium sulfite/ ammonium bisulfite	water wrap	endothermic	normal, fine, or damaged	weak curl or body wave	minimal swelling	requires heat from hair dryer; produces weak curls

Supplement 18.4

PRELIMINARY TEST CURL PROCEDURE

Supplement 18.5

SAFETY PRECAUTIONS FOR PERMANENT WAVING

- Always protect clients clothing with the proper waterproof drape.
- Use two towels: one under the drape and one over the drape.
- Always examine the client's scalp before a perm service. Do not proceed if abrasions are present.
- Do not proceed with the perm if the client has ever experienced an allergic reaction to the products.
- Do not perm excessively damaged hair or hair that has been treated with hydroxide relaxers.
- Always apply a protective cream barrier around the client's hairline before applying the waving solution.
- Immediately replace cotton coils or towels that have become saturated with solution.
- Always protect the client's eyes when applying waving and neutralizing solutions by providing the client with a clean towel to hold over their eyes during the application. In case of accidental exposure, rinse thoroughly with cool water.
- Always follow the manufacturer's directions.
- Do not dilute or add anything to waving or neutralizing solutions unless specified in the manufacturer's directions.
- Wear gloves when applying solutions.
- Do not save opened or unused products as the strength and effectiveness will change if not used promptly.
- Unless otherwise specified in the product instructions, apply waving and neutralizing solutions liberally to the top and underside of each rod.
- Start at the crown and progress systematically down each section. (Some barbers prefer to start at the top of head). Be sure that the surface area of the wound hair is wet with lotion so penetration is even.
- Follow the same application pattern for the neutralizer as used with the waving solution to avoid missing any rods.
- Sometimes it is necessary to re-saturate the rods during processing. This may be due to evaporation of the solution, dryness of the hair, hair that was poorly saturated the first time, improper selection of solution strength, or failure to follow manufacturer's directions. Reapplying the solution will hasten processing so watch the wave development closely as negligence may result in hair damage.

Supplement 18.6

SELECTING THE CORRECT RELAXER

Active Ingredient	pH	Marketed As	Advantages	Disadvantages
Sodium hydroxide	12.5 to 13.5	Lye relaxer	Very effective for extremely curly hair	May cause scalp irritation and damage the hair
Lithium hydroxide and potassium hydroxide	12.5 to 13.5	No-mix, lye relaxer	Very effective for extremely curly hair	May cause scalp irritation and damage the hair
Guanidine hydroxide	13 to 13.5	No-lye relaxer	Causes less skin irritation than other hydroxide relaxers	More drying to hair with repeated use
Ammonium thioglycolate	9.6 to 10.0	Thio relaxer, no-lye relaxer	Compatible with soft-curl permanent waves	Strong, unpleasant ammonia smell
Ammonium sulfite or ammonium bisulfite	6.5 to 8.5	Low-pH relaxer, no-lye relaxer	Less damaging to hair	Does not relax extremely curly hair sufficiently

Supplement 18.7

GUIDELINES FOR FINISHING A CHEMICAL BLOW-OUT SERVICE

Guidelines for performing the final steps of a chemical blow-out service after processing.

- Use a wide-tooth comb or pick to comb the hair upward and slightly forward. The hair closest to the scalp gives direction to the hair; therefore it must be picked upward and outward. Start at the crown and continue until all of the hair has been combed out from the scalp and distributed evenly around the head. By combing in a circular pattern, splits are usually avoided.
- Place the client under a hood hairdryer until the hair is dried.
- Once dried, the hair is ready for shaping. Evenness is very important at this point. The hair length is checked to make sure that the shortest hair is used as the guide for the balance of the head.
- Cutting should begin at the sides. The hair is evened out around the head with clippers or shears while picking the hair outward from the scalp. The hair should be cut in the direction in which it is to be combed. The object is to achieve a smooth, even cut that is properly contoured. The final cutting should be done only with shears to even out loose or ragged ends.
- Outline the hairstyle at the sides, around the ears, and in the nape area, using either shears or an outliner. After the hair is cut to the desired style, the finishing touches are applied. Fluff the hair slightly with the pick where required and spray lightly to hold the shape.

Supplement 18.8

SAFETY PRECAUTIONS FOR CHEMICAL HAIR RELAXING

- Always protect client's clothing with the proper waterproof drape.
- Use two towels: one under the drape and one over the drape.
- Always examine the client's scalp before a relaxer service. Do not proceed if abrasions are present.
- Do not proceed if the client has ever experienced an allergic reaction to the products.
- Do not relax excessively damaged hair.
- Do not use thio relaxers on hair that has been treated with hydroxide relaxers.
- Always apply a protective cream barrier around the client's hairline before applying the relaxer.
- Base the scalp with a protective cream as directed by the product manufacturer.
- Always be careful of the client's eyes when applying relaxers and neutralizing solutions. In case of accidental exposure, rinse thoroughly with cool water.
- Always follow the manufacturer's directions.
- Do not dilute or add anything to relaxer creams unless specified in the manufacturer's directions.
- Wear gloves when applying relaxers.
- Do not save mixed products, as the strength and effectiveness will change if not used promptly.
- Apply relaxer cream to the most resistant area first.
- Follow the same pattern for smoothing the relaxer as was used during the application process.