



# Secundum Artem

*Current & Practical Compounding  
Information for the Pharmacist.*

## COMPOUNDING MEDICATION STICKS

### INTRODUCTION

Medication "sticks" are convenient forms for administering topical medications. They are easy to transport and can be applied directly to the affected site. Sticks can be prepared in different sizes and shapes for application to different areas of the body. They can be prepared from different materials to provide topical or systemic effects. And they are very easily prepared extemporaneously. Medications and ingredients that have been incorporated into sticks include local anesthetics, sunscreens, oncology drugs, antivirals, antibiotics and others.

This dosage form provides compounding pharmacists with the opportunity to serve patients and physicians with a unique drug delivery system to solve medication application/administration problems. It has become a rapidly-growing segment of compounding.

For information on "sticks", it is advantageous briefly to review cosmetic formulations. Sticks constitute an individual cosmetic form, and the only solids (with the exception of cakes such as rouges) with which cosmetic chemists deal.

Lipstick is the prototype of all cosmetic sticks including poured mascara and deodorant sticks. One will observe a vast difference in physical properties among various lipsticks. Some are quite hard; some are brittle; others are soft. Some are greasy; some are sticky. Some are smooth and velvety; others crumble easily. Since lipstick has a definite mechanical function to perform, its consistency is of the utmost importance. Its function is to provide a vehicle to facilitate easy, uniform application of color to the lips. If the stick is too hard, this purpose will not be fulfilled properly. If it crumbles or is too sticky, it will smear and cause consumer objections. The same principles, in general, apply to the formulation of medication sticks.

The materials that give body to sticks are waxes, polymers, resins, dry solids fused into a firm mass, and fused crystals. An example of fused sticks is styptic pencils (in their preparation, crystals are heated until they lose their water of crystallization and become molten, then are poured into molds and allowed to harden again). Resin is used in connection with epilating wax. The resin and pitch or waxes are melted and poured into appropriate molds in which they solidify in stick form.

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### HISTORY AND DEFINITIONS

The science of cosmetic preparations is as old as recorded history, perhaps older. In the fifteenth to seventeenth centuries, the cosmetic literature was limited to the "books of secrets" devoted not only to bodily embellishment but also to medicine, in addition to the care of the home and other topics. Formulas were written down in published books over the years, but it was not until the 1940s that cosmetic compendia were published in English.

In the earliest times, cosmetics were associated with religious practices (the use of aromatic incense, oils and ointments for anointing both the living and the dead). Much is written in history books about the ancient Egyptians, Assyrians, Chaldeans, Babylonians and others. The Jews improved upon this knowledge and carried it to unprecedented heights during the early period of their development. In Egypt, many of the high priests became recognized as medical practitioners, and everything related to the care of the body enjoyed a long period (four to five thousand years) associated with medicine. For most of this period, the history of cosmetics must be traced through the history of medicine and pharmacy. Included were activities related to bathing, arts of makeup and hairdressing, hair dyeing and waving, and embalming. The writings of Dioscorides and Zozimos (known to students of pharmacy) explain many of the formulations used.

Hippocrates advanced the study of dermatology and advocated correct diet, exercise, sunlight, special baths and massage as aids to good health and beauty. Cornelius Celsus, Pliny the Elder, Pedanios Dioscorides and Galen all contributed to the medical and cosmetic literature of their days. In the current millennium, cosmetics (when not made in the home) usually were prepared by pharmacists. Cosmetics as a specialty began separating from medicine during the period 1200-1500. Following this, there appears to be have been a separation of cosmetics into two branches: (1) those used for routine beautification of the skin, and (2) those used for the correction of cosmetic disorders of the skin, hair, nails and teeth (drawing on dermatology, pharmacology, dentistry, ophthalmology, dietetics and other accepted medical arts).

The first Pharmacopeia of London, published in 1618, showed that the pharmacists had all the necessary equipment and skill to make and sell cosmetic products, but the increasingly stringent regulations governing their work kept most of them exclusively occupied with the compounding of medications.

During the 17th and 18th centuries, cosmetic products

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were still made principally in the home, although the number of shops where many items could be bought increased steadily. Raw materials were purchased from pharmacists and “druggists” (new term designation of German origin), but very few professional apothecaries sold anything besides assorted essence and “perfumed waters”.

Sticks made from a base of oil and wax came into limited use before WWI as lipsticks, generally colored with carmine. These lipsticks only applied a colored layer to the lips which, when removed, left the lips their natural color. Most dyes were water insoluble but it was discovered that the incorporation of a water soluble dye could actually dye the lips, if they were moistened prior to applying the lipstick. This was an early approach to the use of sticks containing a material that interacted with the skin. Some of these water soluble dyes would develop an intense red color as the pH was lowered.

Cosmetic products in recent years have resulted from cosmetic scientists introducing and improving products for different applications. It is interesting that some cosmetic products are still widely used in the pharmaceutical sciences, including powders, sticks, gels, solutions, suspensions, pastes, ointments and oils.

#### APPLICATIONS/USES

Different bases can be selected for various applications.

**Melting bases:** Bases prepared from waxes, oils, polymers and gels will soften at body temperature and spread the drug-vehicle mixture over the skin. Penetration enhancers can increase the amount of transdermal drug delivery. If waxes and oils or plain polymers (PEGs) alone are used, a topical effect should be achieved. These bases can be further divided into opaque and clear. The opaque bases would include the waxes/oils, PEGs, etc. The clear bases would include sodium stearate/ glycerin mixtures.

**Moisten bases:** solid sticks which must be moistened to become “activated”. A concentrated solution of the drug will be present at the tip of the stick and, when applied, will exert its effect topically. An example is the styptic pencil containing alum or aluminum sulfate. Other drugs that might not be stable in other forms but would be stable in a dry, hard crystalline stick could be used in this fashion .

#### COMPOSITION AND FORMULAE

Three categories of medication stick base formulas and other formulas will be presented: **soft-opaque**, **soft-clear** and **hard**. Example formulas

will be presented for illustrative purposes only.

#### Soft-Opaque Sticks

**Stick Formulation No. 1** (A general purpose, water-repellant base)

Beeswax	34
Cocoa Butter	8
Lanolin	6
Petrolatum	18
Paraffin Wax	10
Talc (optional)	16
Perfume (optional)	1
Active Drug	qs

1. Weigh/Measure the ingredients.
2. Triturate the Active Drug with the Petrolatum mass until smooth.
3. Melt the Beeswax, Cocoa Butter, Paraffin and Lanolin and add the Petrolatum base; stir thoroughly and slowly sift in the Active Drug and Talc (optional) while mixing.
4. Add Perfume, stir and pour into molds or containers.

**Stick Formulation No. 2** (A softer, general purpose water-repellant base)

Talc (optional)	19
Petrolatum	20
Paraffin Wax	30
Cocoa Butter	15
Beeswax	10
Perfume (optional)	1
Active Drug	qs

1. Weigh/Measure the ingredients.
2. Mix the Active Drug and Talc with the Petrolatum and triturate until smooth.
3. Melt the waxes and the Cocoa Butter with the petrolatum mixture; mix thoroughly, add perfume and pour into molds.

**Stick Formulation No. 3** (Stiff stick that will take up some water)

White Beeswax	31
Paraffin	5
Cocoa Butter (Fattibase)	7
Aquabase	34.5
Castor Oil, Tasteless	4
Perfume	0.9
Preservative	0.1
Butyl Stearate	5

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1. Weigh/Measure the ingredients.
2. Mix the Butyl Stearate and the Castor Oil.
3. Melt the Aquabase using mild heat.
4. Add the Butyl Stearate:Castor Oil mixture and mix thoroughly.
5. Melt the Beeswax, Paraffin and Cocoa Butter and mix with #4.
6. Mix thoroughly and add Perfume and Preservative. When the mass reaches 110°F, keep the temperature of the batch at this point while filling the molds.

**Stick Formulation No. 4** (Stiff stick that will take up some water)

Cocoa Butter	7
Cetyl Alcohol	3
Triethanolamine Stearate	4
Paraffin	5
White Beeswax	24
Aquabase	22.5
Petrolatum	16
Perfume	0.9
Preservative	0.1
Butyl Stearate	5

1. Weigh/Measure the ingredients.
2. Mix the Butyl Stearate with the Petrolatum and the Aquabase.
3. Melt the Beeswax, the Paraffin, Cetyl Alcohol, Triethanolamine Stearate and Cocoa Butter.
4. Combine the two mixtures (#2 and #3).
5. Add the Perfume and Preservative and mix well.
6. When the mass reaches 110°F, keep the temperature of the batch at this point while filling the molds.

**Stick Formulation No. 5** (Stiff stick that will take up some water)

Paraffin	4
Cetyl Alcohol	3
Cocoa Butter	6
White Beeswax	30
Aquabase	23
Castor Oil Tasteless	5
White Petrolatum	15.5
Perfume	0.9
Preservative	0.1

1. Weigh/Measure the ingredients.
2. Mix the White Petrolatum, Aquabase and the Castor Oil Tasteless.
3. Melt the Beeswax, Paraffin, Cetyl Alcohol and Cocoa Butter.
4. Combine the two mixtures (#2 and #3).
5. Add the Perfume and Preservative and mix well.
6. When the mass reaches 110°F, keep the temperature of the batch at this point while filling the molds.

**Stick Formulation No. 6** (Stiff base that will take up some water)

White Beeswax	30
Cetyl Alcohol	8
Cocoa Butter (Fattibase)	6
Carnauba Wax	1
Castor Oil Tasteless	2
Aquabase	20
Petrolatum	13.5
Perfume	0.9
Preservative	0.1
Butyl Stearate	5

1. Weigh/Measure the ingredients.
2. Melt the White Wax, Cetyl Alcohol, Cocoa Butter, Butyl Stearate and Carnauba Wax.
3. Melt the Aquabase, Castor Oil Tasteless and Petrolatum.
4. Mix #2 and #3 together.
5. Add the perfume and preservative and mix well.
6. When the mass reaches 110°F, keep the temperature of the batch at this point while filling the molds.

**Stick Formulation No. 7** (Water-repellent stick base)

Cocoa Butter	6
Cetyl Alcohol	3
Stearic Acid	4
Paraffin	4
Cetyl Esters Wax	5
White Beeswax	23

Lanolin	5.5
White Petrolatum	30
Castor Oil	6
Perfume	0.9

1. Weigh/Measure the ingredients.
2. Melt the White Beeswax, Cetyl Alcohol, Stearic Acid Paraffin and Cetyl Esters Wax together and mix well.
3. Melt the White Petrolatum, Lanolin and Castor Oil together and mix well.
4. Add the melt from step #2 to the melt in step #3 with stirring.
5. Cool to about 110°F and add the Perfume, mix well and fill molds.

**Stick Formulation No. 8** (Hard, firm stick)

White Petrolatum	70.75
Cetyl Alcohol	3
Lanolin	10.5
White Beeswax	5.25
Cetyl Esters Wax	10.5

1. Weigh/Measure the ingredients.
2. Melt the Cetyl Esters Wax, White Beeswax and Cetyl Alcohol together and mix well.
3. Melt the Lanolin and White Petrolatum together and mix well.
4. Mix the melt from step #2 to the melt in step #3 with stirring.
5. Cool to about 110°F and fill molds.

**Stick Formulation No. 9** (Camphor Ice-type product (for insect stings and for headaches))

Powdered Camphor	20
Light Beeswax	18
White Petrolatum	15
Cetyl Esters Wax	47

1. Weigh/Measure the ingredients.
2. Melt the Cetyl Esters Wax, Beeswax and Petrolatum.
3. Mix and when the temperature drops to about 50°C, add the Camphor and mix well.
4. Fill molds and cool.

**Stick Formulation No. 10** (Water repellent stick)

Carnauba Wax	10
White Beeswax	15
Lanolin	5
Cetyl Alcohol	5
Castor Oil	65

1. Weigh/measure the ingredients.
2. Melt the Carnauba Wax, White Beeswax and Cetyl Alcohol together.
3. Add the Lanolin and Castor Oil and mix well.
4. Cool to about 110°F and fill molds.

**Stick Formulation No. 11** (Chapstick-sunblock 15)

(For information purposes only--complete formula not available)

Padimate O	7%
Oxybenzone	3%
Petrolatum	
Paraffin	
Mineral Oil	
White Wax	
Isopropyl Lanolate	
Camphor	
Lanolin	
Isopropyl Myristate	
Cetyl Alcohol	
Carnauba Wax	
Fragrance	
Methylparaben	
Propylparaben	

**Stick Formulation No. 12** (Water-repellent stick)

White Wax	26%
Hydrogenated Cottonseed Oil	5
Castor Oil	43
Carnauba Wax	4
Mineral Oil	6

1. Weigh/measure the ingredients.
2. Melt the White Wax and Carnauba Wax together.
3. Add the Castor Oil, Mineral Oil and Hydrogenated Cottonseed Oil.
4. Mix well, cool to about 110°F and pour into molds.

**Stick Formulation No. 13** (Smooth stick that will absorb some water)

White Wax	36
Beeswax, Yellow	18
Cocoa Butter	19
Absorption Base (Aquabase)	5.5
Mineral Oil	9.5
Oleyl Alcohol	3
Absorption base for above (or use Aquabase)	
Petrolatum	94%
Cholesterol	3
Cetyl Alcohol	3

1. Weigh/measure the ingredients.
2. Melt the White Wax and Yellow Wax together.
3. Melt the Absorption Base and Cocoa Butter together.
4. Add the melt from step #2 to the melt from step #3.
5. Add the Mineral Oil and Oleyl Alcohol and mix well.
6. Cool to about 110°F and pour into molds.
7. For the Absorption Base, melt the Cetyl Alcohol and Cholesterol together; add the Petrolatum, mix well and cool.

**Stick Formulation No. 14** (Acyclovir Lip Balm, Plain and with PEG) (Note: these formulas can be modified by the incorporation of lidocaine, PABA or other ingredients as needed)

**Formula 1 (plain)**

Acyclovir (200 mg capsules)	6
Span 80	0.5 g
Glyceryl Monostearate	5 g
W/O Emulsion Base (Hydrocream)	19.5 g

1. Weigh/measure the ingredients.
2. Heat the Glyceryl Monostearate to about 55°- 70° C and add the Span 80, followed by the Acyclovir powder, previously removed from the capsules and comminuted to obtain a fine, uniform powder.
3. Heat the w/o Emulsion Base and add to this the melted Glyceryl Monostearate mixture, stir and remove from heat.
4. Stir rapidly, cool and pour into tubes or molds.

**Formula 2 (with PEG)**

Acyclovir (200 mg Caps)	6
Polyethylene Glycol 3350	6.5 g
Polyethylene Glycol 400	15 mL

1. Weigh/measure the ingredients.
2. Heat the Polyethylene Glycols to about 55°C.
3. Empty the Acyclovir capsules into a mortar and reduce the particle size to a fine powder.
4. Add these powders to the melted base and mix thoroughly.
5. Cool to just above the melting point of the product, until it starts to thicken.
6. While stirring, pour into the lip balm molds or tubes.

**Stick Formulation No. 15** (Lidocaine 30% Lip Balm)

Lidocaine Base	1.5 g
Polyethylene Glycol 4000	1 g
Polyethylene Glycol 400	2.5 g

1. Weigh/measure the ingredients.
2. Melt the bases together at about 55°C, or, alternatively use Polybase, 3.5 g.
3. Add the powder to the melted base and mix until evenly dispersed.
4. Cool to just above the melting point of the product until it starts to become thick.
6. While stirring, pour into the lip balm molds or tubes.

**Stick Formulation No. 16** (CPM Lip Balm)

Camphor	1%
Phenol	0.5%
Menthol	1%
Lip Balm Base (#17, 18, 19 or 20)	qs

1. Weigh/measure the ingredients.
2. Mix the Camphor, Phenol and Menthol until a eutectic liquid forms.
3. Melt the Lip Balm Base in a beaker using gentle heat.
4. Remove from heat and add the eutectic mixture to the base while still fluid and mix thoroughly with a stirring rod.
5. Pour into lip balm molds or tubes. Cool and package.

**Stick Formulation No. 17** (Lip Balm Base)

White Wax, NF	5%
White Petrolatum, USP	95%

1. Weigh/measure the ingredients.
2. Melt the White Wax in a beaker using low heat.
3. Add the White Petrolatum and mix thoroughly with stirring rod until uniform.
4. Cool until thick and pour into ointment jar for storage at room temperature until used.

**Stick Formulation No. 18** (Lip Balm Base)

White Wax, NF	30%
Cetyl Esters Wax, NF	30%
Mineral Oil, USP	40%

1. Weigh/measure the ingredients.
2. Melt the White Wax and Cetyl Esters Wax in a beaker.
3. Add the Mineral Oil with stirring.
4. Cool until thickened.
5. Pour into ointment jar for storage until used.

**Stick Formulation No. 19** (Lip Balm Base)

Anhydrous Lanolin, USP	10%
Cetyl Esters Wax, NF	22%
White Wax, NF	28%
Mineral Oil, USP	40%

1. Weigh/measure the ingredients.
2. Melt the White Wax and Cetyl Esters Wax in a beaker until liquid.
3. Add Anhydrous Lanolin with thorough stirring.
4. Add Mineral Oil with stirring until thoroughly mixed.
5. Remove from heat, cool, and pour into ointment jar until used.

Alternative Formulation: Add 5-10% White Wax to Aquabase.

**Stick Formulation No. 20** (Lip Balm Base)

Glyceryl Monostearate, NF	20%
Span 80	2%
Oil-in-Water Emulsion Base (Dermabase)	78%

1. Weigh/measure the ingredients.
2. Melt the Glyceryl Monostearate at 55°-70°C in a beaker.
3. Add the Span 80 and mix thoroughly.
4. Heat the Emulsion Base to about 60°C and pour into the other melted mixture.
5. Stir rapidly.
6. Cool and pour into ointment jar until used.

**Soft-Clear Sticks**

**Stick Formulation No. 21** (Analgesic Medication Stick)

Methyl Salicylate	35%
Menthol	15%
Sodium Stearate	13%
Purified Water	12%
Propylene Glycol	25%

1. Weigh/measure the ingredients.
2. Gently heat and melt the Sodium Stearate.
3. Mix the Purified Water with the Propylene Glycol and add to the melted Sodium Stearate.
4. Mix thoroughly, remove from heat and allow this base to cool slightly.
5. Dissolve the Menthol in the Methyl Salicylate, add this solution to the base and mix thoroughly.
6. As the product begins to thicken, continue to mix and pour into either 5 g or 20 g stick containers.
7. Allow to harden at room temperature.

**Stick Formulation No. 22** (Clear Stick Base)

Sodium Stearate	7
Alcohol	65
Propylene Glycol	25
Cyclomethicone	3

1. Weigh/measure the ingredients.
2. Melt the Sodium Stearate.
3. Mix the Alcohol, Propylene Glycol and Cyclomethicone and add to the melted Sodium Stearate.
4. Mix well, cool slightly and pour into stick molds.

**Hard Sticks**

Styptic Pencils-These are used for stopping the flow of blood from cuts. There can be two types, one with a hard crystalline structure and the other with a wax base.

**Stick Formulation No. 23**

Alum	70
Ferric Sulfate	7
Copper Sulfate	7
Ammonium Chloride	9
Zinc Sulfate	7

1. Weigh/Measure the ingredients.
2. Mix the ingredients together.
3. Heat in a porcelain or glass lined container until the ingredients fuse.
4. Pour into molds.

**Stick Formulation No. 24**

Ammonium Chloride	7
Aluminum Sulfate	27
Ferric Sulfate	40
Copper Sulfate	26

Mix the ingredients together; heat in a porcelain lined vessel until they fuse and pour into molds while the mass is molten.

**Stick Formulation No. 25** (Crayon type)

Titanium Dioxide	3.7
Alum	18
Aluminum Chloride	15
Oxyquinoline Sulfate	2.3
Cocoa Butter (or Fattibase)	22
Cetyl Esters Wax	19
Petrolatum	13
Lanolin	7

1. Weigh/Measure the ingredients.
2. Triturate the Alum, Titanium Dioxide and Aluminum Chloride.
3. Add enough Petrolatum to make a viscous paste.
4. Mix the rest of the Petrolatum with the Oxyquinoline Sulfate.
5. Melt the Fattibase (or Cocoa Butter), Cetyl Esters Wax, and Lanolin, stir in the Alum, Petrolatum mixture and then the Oxyquinoline mixture.
6. Pour into molds

**PREPARATION METHODS/TECHNIQUES**

Desirable characteristics of a good stick include:

- Spreads easily without excessive greasiness.
- Does not sweat, crumble or crack.



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As a starting point, a familiarity with waxes is helpful, beginning with the high melting point waxes such as carnauba down the range through beeswax, paraffin and cocoa butter including the waxy fatty acids such as spermaceti and stearic acid and the waxy alcohols such as cetyl and stearyl alcohol. (See Table 1) One soon finds that no single one of these waxy substances serves the purpose alone. The high melting point waxes must be cut with the low melting point waxes to produce a combination that will soften at body temperature. One then discovers the necessity of adding lubricants to minimize the coherence of the waxes and to provide easy spreading qualities. Following such a procedure one eventually develops a stick having the desired physical properties.

The consistency of the stick is determined by the melting point of the waxes. To change the consistency of the stick, take its melting point and adjust it by changing the percentage of the highest melting point wax.

The experimenter must consider the desired application for the stick base. The goal is to prepare a combination of waxes that will soften at body temperature and still contain substances designed to function as lubricants and other ingredients to promote the absorption and emollient effects.

When a batch is made, it should be molded at once and not permitted to grow cold, thus requiring reheating. The trimmings and scraps from the molds, together with the rejected sticks containing mold marks or pin holes should not be thrown back into the regular batch and remelted. If remelted properly and separately, these re-made sticks will be as good as the others.

#### EQUIPMENT REQUIRED

Equipment required for making sticks consists of a hot plate, double boiler, beakers/containers, a small mixer, possibly an ointment/roller/stone mill, a set of molds of the desired shape, and a refrigerator for chilling. Temperature control is important because a nice appearance of the finished stick is related to temperature.

Molds are available that are designed to be the ultimate dispensing container. These are the "Chapstick-type" tubes. Alternatively, one can use lipstick molds or even suppository molds and place the product in a dispensing holder.

#### PHYSICOCHEMICAL UNIQUENESS OF COMMON INGREDIENTS

##### Oils

Vegetable oils such as olive oil and sesame oil have a tendency to rancidity.

Mineral oils resist rancidity but may be limited in their ability to dissolve certain ingredients. They also tend to make the product smear and run off. They can be used in small proportions to enhance gloss.

Castor oil is a unique vegetable oil for its high viscosity, which helps to delay the settling of ingredients from the molten stick mass and to lessen the tendency of the applied stick to smear and run off.

Butyl stearate has found rather wide use in the past in the preparation of sticks. A pure grade is free of disagreeable odor and does not turn

rancid.

Fatty esters of lower alcohols generally have properties similar to butyl stearate.

Cocoa butter is relatively widely used, since it melts upon application at about body temperature. However, it may tend to "bloom", or come to the surface in irregular fashion, eventually developing unsightly craters or excrescences, a characteristic which may be overcome by the use of commercially available fatty acid bases (Fattibase). Petrolatum is very stable, produces good gloss and therefore is useful in the preparation of sticks.

Lanolin and absorption bases are useful in sticks as they may enhance the incorporation of water containing ingredients.

Lecithin can be used in sticks to improve smoothness, emollience and ease of application.

##### Waxes

Carnauba wax is one of the harder waxes, so a small percentage raises the melting point and the strength.

Candelilla wax has a lower melting point than carnauba, and must be used in larger proportions to obtain equal effects.

Beeswax is the traditional stiffening agent for sticks and still is extensively used. It may be used as the only wax, but this would result in a rather dull stick with too much drag. The hard waxes yield better gloss.

Paraffins are too weak and brittle to be of much value in sticks, although small amounts may improve gloss. Immiscibility with castor oil may limit their use in some applications.

Synthetic waxes of many types are available. Each must be judged on its own merits.

Hydrogenated castor oil is a brittle white wax which yields high gloss but little strength.

##### Water-Soluble Bases

Polyethylene glycols and their ethers are available in a great variety. They are very water-soluble and are easy to remove from the skin. Propylene glycol monoesters are relatively good solvents and are found in some sticks.

Sodium stearate-Propylene glycol combinations are very widely used for deodorant sticks and are good for the application of topical drugs. These bases melt at body temperature, are colorless and rub in nicely.

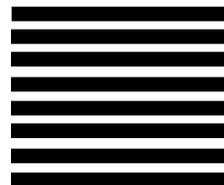
In some sticks, pleasant fragrance is a factor for consumer acceptance. The flavoring oils must be selected to be free of irritating effects (burning) and from disagreeable taste when the proposed use is near to or on the lips.

#### QUALITY CONTROL

Quality control procedures that can be utilized in the preparation of medication sticks include weight variation, melting point and physical observation. Also, the preparation of extra medication sticks that can be placed in storage over the expected use or life of the prescription would be useful. If adverse changes occurred in the dosage form, the patient could be contacted and the remaining sticks recalled.



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### STORAGE/LABELING

Package in 5 g, 25 g or other appropriate size tubes, depending upon the application.

Keep out of reach of children. Keep out of the heat/direct sunlight. Store at either 5°C or 25°C, depending upon the composition.

### STABILITY

Many of these products do not contain water, which may result in a good stability profile for the active drug. However, when heat is used in the preparation, drug degradation may result. Care should be observed in estimating a reasonable beyond-use date.

### COUNSELING

Counseling with this dosage form depends upon the active drug and the method of application. The following may be considered:

- Apply only to the involved area and not to surrounding skin.
- Apply liberally over the area.
- Apply as needed.
- Clean the surface of the stick with clean tissue after use.
- Do not share this product with others because of the possibility of transmitting infections.

### HINTS AND TIPS

- Vitamin E and A have been added to these preparations for emollient and skin enhancement effects.
- Zinc Oxide, as well as PABA, can be incorporated as a sun block.
- Perfume sticks can be prepared by the addition of an appropriate perfume oil.

### SUMMARY

The history of cosmetics parallels that of humans. Many cosmetic products also serve as medication or drug dosage forms (drug delivery systems). Sticks may be of relatively recent vintage for both cosmetic and medical usage. Today, medication sticks provide pharmacists, patients and physicians with a very convenient, relatively stable, easy to prepare dosage form for the topical delivery of drugs. Their use will probably continue to increase in the future.

**TABLE 1**  
MELTING/CONGEALING POINTS/RANGES OF WAXES, OILS AND POLYETHYLENE GLYCOLS

ITEM	MELTING POINT °C	CONGEALING POINT °C
<b>Waxes</b>		
Carnauba Wax	81-86	
Cetostearyl Alcohol	48-55	
Cetyl Alcohol	45-50	
Cetyl Esters Wax	43-47	
Cholesterol	147-150	
Cocoa Butter	30-35	
Emulsifying Wax	48-52	
Glyceryl Monostearate	nlt 55	
Hard Fat	27-44	
Microcrystalline Wax	54-102	
Paraffin		47-65
Polyoxyl 40 Stearate		37-47
Propylene glycol Monostearate		nlt 45
Purified Stearic Acid		66-69
Stearic Acid		nlt 54
Stearyl Alcohol	55-60	
White Wax	62-65	
Yellow Wax	62-65	
<b>Oils</b>		
Castor Oil		-10 to -18
Corn Oil	-18 to -10	
Cottonseed Oil		0 to -5
Hydrogenated Castor Oil	85-88	
Hydrogenated Vegetable Oil	61-66	
Oleic Acid		nmt 10
Peanut Oil		-5
Polyoxyl 40 Hydrogenated Castor Oil		20-30
Soybean Oil		-10 to -16
<b>Polyethylene Glycols</b>		
PEG 300		4 to 8
PEG 1500	44-48	
PEG 3350	54-58	
PEG 6000	58-63	

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