



INSTITUTE FOR CLINICAL
SYSTEMS IMPROVEMENT

Health Care Guideline for Patients and Families

The information contained in this document is a translation of an ICSI health care guideline from medical terminology to commonly used and easily understood English. It is intended for patients, their families and/or caregivers, and other individuals who have little or no health care training. The medical terms used in this document are followed by italicized statements in parentheses that explain the meaning of the term.

The *Acne Management for Patients and Families* should not be construed as medical advice or medical opinion related to any specific facts or circumstances. If you are seeking medical advice, you are urged to consult a health care professional regarding your own situation and any specific medical questions you may have. In addition, you should seek assistance from a health care professional in interpreting any *ICSI Health Care Guideline for Patients and Families* and applying it in your individual case.

This translation is available to view and download as a portable document file (PDF). Adobe Acrobat Reader is required. The document can be copied for individual use, and physicians and other direct providers of care may distribute copies to their patients.

All other copyright rights are reserved by the Institute for Clinical Systems Improvement, Inc. (ICSI). ICSI assumes no liability for any adaptations or revisions or modifications made to this *Health Care Guideline for Patients and Families*.

The next scheduled revision will occur within 24 months.

The numbers in the boxes correspond with the specific flow chart notes on the following pages for more detailed information. Not all items will have a flow chart note.

3

3a. Mild Acne

- < 20 comedones, *or* < 15 inflammatory papules, *or* a lesion count of < 30

3b. Moderate Acne

- 15-50 papules and pustules with comedones and rare cysts. Total lesion count may range from 30-125.

3c. Severe Acne

- Primary inflammatory nodules and cysts. Also present are comedones, papules and pustules *or* total lesion count of greater than 125.

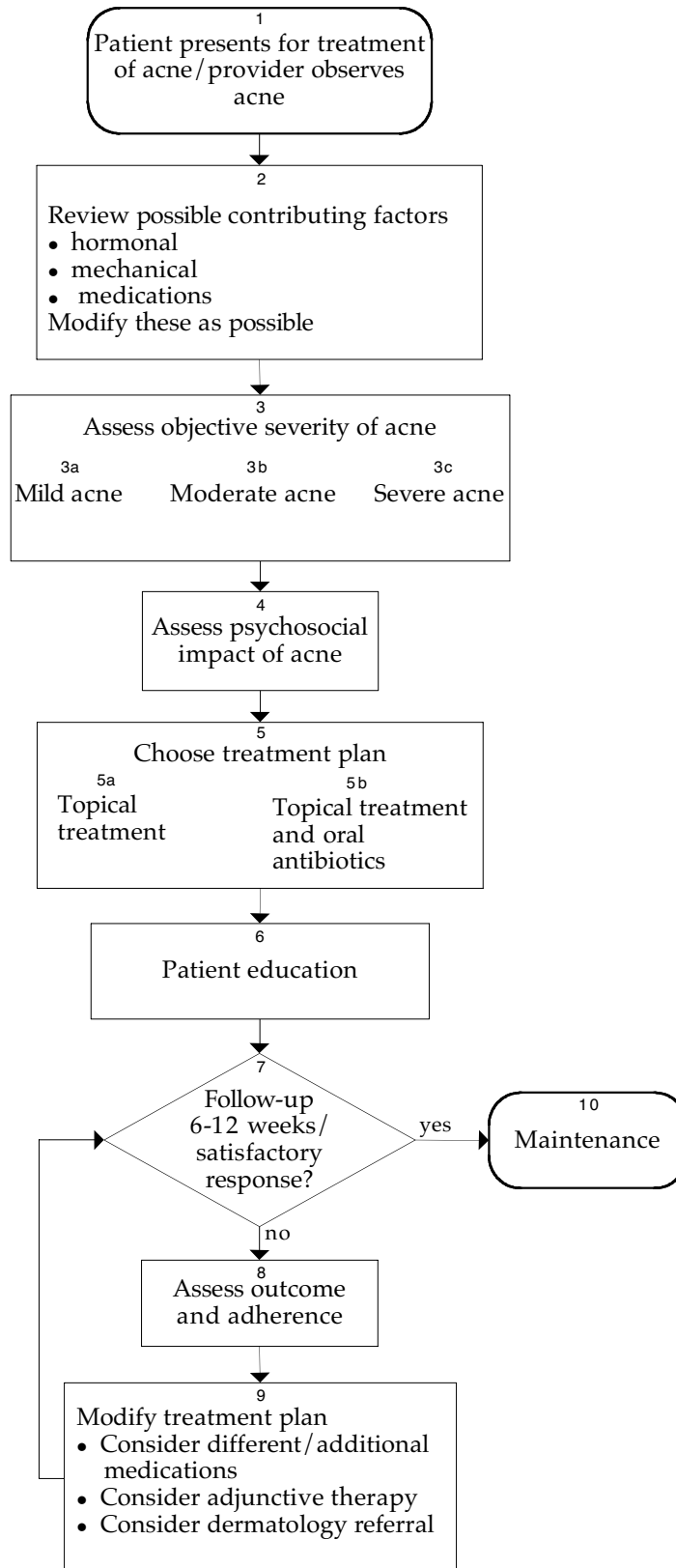


Table of Contents

Flowchart (Main)	1
What is an ICSI Health Care Guideline for Patients and Families?	3
How are ICSI Health Care Guidelines developed?	3
How Do I Use the Flowchart?	3
Flow Chart Notes	4-16
Target Population.....	4
Definition of Acne	4
Patients Presents for Treatment of Acne/Provider Observes Acne.....	4
Review Possible Contributing Factors	4-5
Assess Objective Severity of Acne.....	5-6
Assess Psychosocial Impact of Acne.....	6
Choose Treatment Plan	7-12
Patient Education.....	12-14
Follow-Up 6-12 Weeks/Satisfactory Response?	14
Assess Outcome and Adherence.....	14
Modify Treatment Plan.....	15-16
Maintenance	16
Appendix A – Glossary of Terms	17-20
Website Resources	21

Foreword

What Is an ICSI Health Care Guideline For Patients and Families?

This document is a summary of an ICSI health care guideline that has been "translated" from medical terminology to commonly used and easily understood English. It is intended for patients, their families and/or caregivers, and other individuals who have little or no health care training. The guideline is designed to help you understand the diagnostic and treatment options recommended for a particular condition. Being better informed should help you during discussions with your physician or other health care professional.

However, an ICSI Health Care Guideline for Patients and Families should not be construed as medical advice or medical opinion related to any specific facts or circumstances. If you are seeking medical advice, please consult a health care professional regarding your particular situation, any specific medical questions you may have, and the application of the guideline to your individual case.

This translation can be viewed and downloaded as a portable document file (PDF) on <http://www.icsi.org>. Adobe Acrobat Reader is required. The document may be copied for individual use, and health care professionals may distribute copies to patients. Instructions for accessing these guidelines are listed below:

- <http://www.icsi.org>
- click on "For Patients" at the top
- select the category you are interested in

You will find the healthcare guideline for Patients and Families as well as links to other resources for that topic.

All other copyright rights are reserved by ICSI. ICSI assumes no liability for any adaptations or revisions or modifications made to this guideline.

How are ICSI Health Care Guidelines Developed?

ICSI, the Institute for Clinical Systems Improvement, is an independent, non-profit organization dedicated to helping identify best clinical practices for health care professionals. A significant part of ICSI's mission is to create and maintain clinical guidelines to help health care professionals evaluate and treat patients with a particular condition. A team of experts develops each ICSI guideline, using the most current information about a particular condition. This information is carefully evaluated, reviewed, and compiled before it is published.

Each guideline recommends a strategy for making decisions, but it is not intended to replace a physician's judgment or establish a protocol (strict plan) for all patients. One set of recommendations is rarely the only approach to a problem.

How Do I Use the Flowchart?

The flowchart represents the major steps in the process of evaluating and treating a patient with a particular condition. Numbers within the flowchart correspond with a flowchart note. Some flowchart boxes will not have a corresponding note.

Flowchart Notes

Target Population

This guideline addresses the management of acne for all patients. It emphasizes initial diagnosis and treatment options and provides clinical guidance, especially to primary care providers. Treatment of rare forms of acne and of refractory disease (*resistant to treatment*) are not included except to indicate when referral is appropriate. This guideline excludes rosacea (*common skin condition characterized by redness, pimples, and broken blood vessels*) and folliculitis (*inflammation of the hair follicles due to an infection or irritation*).

Definition of Acne

Acne is a chronic disorder of the hair follicles and oil glands. It is characterized by blackheads, pimple outbreaks, cysts, infected abscesses, and sometimes scarring. Acne most commonly appears on the face but can also occur on the neck, chest, back, shoulders, and upper arms. The condition is most prevalent in adolescents but can occur in adults. Chronic acne can affect self-esteem. Severe cases can lead to scarring.

Acne Management Flowchart Notes

1. Patient Presents for Treatment of Acne/Provider Observes Acne

When a patient with acne for an office visit is scheduled for different reason, identify what the patient's comfort level with the acne condition is and what their desire for treatments would be.

2. Review Possible Contributing Factors

Hormonal

Signs of androgen excess (*too much of androgen, a male hormone*) would include:

- Precocious puberty (*sexual characteristics at an early age*)
- Hirsutism (*excessive hairiness*)

Possible causes of androgen excess would include:

- Polycystic ovary disease (*disorder characterized by irregular or absent menstrual cycles, obesity, adult acne, excess facial hair and/or diabetes*)
- Adrenal tumor (*tumor on the adrenal gland, an organ that produces various hormones*)
- Ovarian tumor (*tumor on the ovary, the female reproductive organ*)
- Pituitary tumor (*tumor on the pituitary gland, the master gland of the body*)

Mechanical

On occasions, physical occlusion (*obstruction*) may contribute to acne. For example: hockey masks and oil based cosmetics (although most cosmetics today are water based).

Medications

There are many medications that may contribute to the development of acne. In addition to treating the acne, discuss use of these medications with your physician.

Medications Which May Contribute to the Development of Acne				
ACTH	CLOMIPRAMINE	FOSPHENYTOIN	NARATRIPTAN	RIFAMPICIN
ACTINOMYCIN D	CORTICOSTEROIDS	GABAPENTIN	NEFAZODONE	RIFAPENTINE
ACYCLOVIR	CREATINE	GANCICLOVIR	NIMODIPINE	RISPERIDONE
ALOSETRON	CYANOCOBALAMI	GOLD and GOLD COMPOUNDS	NISOLDIPINE	RITONAVIR
ALPRAZOLAM	CYCLOSPORINE	GRANULOCYTE COLONY-STIMULATING FACTOR (GCSF)	NIZATIDINE	SAQUINAVIR
AMITRIPTYLINE	DACTINOMYCIN	GREPAFLOXACIN	NORTRIPTYLINE	SERTRALINE
AMOBARBITAL	DANAZOL	HALOPERIDOL	OLSALAZINE	SIBUTRAMINE
AMOXAPINE	DANTROLENE	HALOTHANE	OXCARBAZEPINE	SIROLIMUS
ANDROSTENEDIONE	DEFEROXAMINE	HEROIN	PANTOPRAZOLE	SMALLPOX VACCINE
ATORVASTATIN	DEMECLOCYCLINE	IMIPRAMINE	PARAMETHADIONE	SPARFLOXACIN
AZATHIOPRINE	DESIPRAMINE	INTERFERONS, ALFA-2	PAROXETINE	STANZOLOL
BASILIXIMAB	DIAZEPAM	ISONIAZID	PENTOBARBITAL	TACRINE
BETAXOLOL	DILTIAZEM	LAMOTRIGINE	PENTOSTATIN	TESTOSTERONE
BEXAROTENE	DISULFIRAM	LANSOPRAZOLE	PERGOLIDE	THIOURACIL
BISOPROLOL	EFLORNITHINE	LEFLUNOMIDE	PHENOBARBITAL	THIOUREA
BUPROPION	EPOETIN ALFA	LEUPROLIDE	PHENYTOIN	TIAGABINE
BUSPIRONE	ESMOLOL	LEVOTHYROXINE	POTASSIUM IODIDE	TIZANIDINE
BUTABARBITAL	ESOMEPRAZOLE	LITHIUM	PREDNISONE	TOPIRAMATE
CABERGOLINE	ETAZOLAM	MAPROTILINE	PRIMIDONE	TRIMETHADIONE
CARBAMAZEPINE	ETHAMBUTOL	MDMA	PROGESTINS	TRIOXSALEN
CARTEOLOL	ETHIONAMIDE	MEDROXYPROG-ESTERONE	PROPAFENONE	TROVAFLOXACIN
CEFAMANDOLE	FAMOTIDINE	MEPHENYTOIN	PROPRANOLOL	VALPROIC ACID
CEFPODOXIME	FELBAMATE	MESALAMINE	PROPYLTHIOURACIL	VENLAFAXINE
CEFTAZIDIME	FENOPROFEN	METHOTREXATE	PROTRIPTYLINE	VERAPAMIL
CETIRIZINE	FEXOFENADINE	METHOXSALLEN	PSORALENS	VINBLASTINE
CHLORAL HYDRATE	FLUCONAZOLE	METHYLTESTOSTERONE	PYRAZINAMIDE	VITAMIN B12
CHLOROTRIANISENE	FLUOXETINE	MINOXIDIL	PYRIDOXINE	ZALCITABINE
CIDOFOVIR	FLUOXYMESTERONE	MIRTAZAPINE	QUINIDINE	ZALEPLON
CIMETIDINE	FLUVOXAMINE	MYCOPHENOLATE	QUININE	ZIDOVUDINE
CIPROFLOXACIN	FOLIC ACID	NABUMETONE	RAMIPRIL	ZOLPIDEM
CLOFAZIMINE	CLOMIPRAMINE	NAFARELIN	NALTREXONE	ZONISAMIDE
CLOMIPHENE	FOSCARNET	NALTREXONE	RIBOFLAVIN	

3. Assess Objective Severity of Acne

Acne severity is the most important clinical diagnostic tool in studies reviewed. For simplification, this guidelines follows the Agency for Healthcare Research and Quality's (AHRQ) recommendation to divide acne into three severity grades: mild, moderate, and severe. There are other ways to grade acne that are used clinically and in research. None, however, is universally accepted. Additionally, psychological impact or the presence of scarring may play a role in assigning a severity grade to the patient.

The following diagnostic tool was designed as a guideline for three lesion (*damaged area of tissue*) counts on the face but may be applicable to grading the severity of acne on the trunk as well.

a. Mild Acne

Mild acne is characterized by predominance of comedones* (fewer than 20), or fewer than 15 inflammatory papules*, or a comedone/papule count of fewer than 30 on the face.

b. Moderate Acne

Moderate acne predominantly exhibits papules and pustules* (about 15-50 lesions) with comedones and rare cysts. Total lesion (comedone, papule, pustule) count may range from 30-125 on the face.

c. Severe Acne

Severe acne is characterized primarily with the presence of inflammatory nodules and cysts.* Also present are comedones, papules, and pustules or total lesion count of greater than 125 on the face.

***Definitions:**

- Closed comedone (*whitehead*): non-inflamed (*non-red*) follicular opening containing a keratotic (*crusty*) plug with a thin overlying epidermal membrane
- Inflammatory: pertaining to injury of body tissue characterized by pain, swelling, redness, and heat
- Lesions: damaged areas of tissue
- Nodule/cyst: poorly marginated, red, tender, sometimes draining, 0.2-3.0 cm indurated (*hardened*) mass in the skin
- Open comedone (*blackhead*): non-inflamed (*non-red*) follicular opening containing a keratotic (*crusty*) plug that appears black
- Papule: small round to oval red elevation of the skin (1-4 mm)
- Pustule: resembles a papule with a central pocket of pus

***Glossary:**

comedone: whiteheads or blackheads

desquamation: shedding or peeling of skin

follicular lipids: fats found in the skin cavities that contain hair roots

P. acnes: propionibacterium acnes – a bacterium involved in acne

4. Assess Psychosocial Impact of Acne (involving both psychological and social aspects)

It is important to assess the psychosocial (*involving both psychological and social aspects*) effect of acne. Studies using "quality of life" surveys show a variety of significant impacts – most frequently, anxiety and depression. Decreased self-esteem, social withdrawal, anger, conduct disorders, and decreased employability have been reported in other studies. The clinical severity of the acne does not always predict the severity of the psychosocial impacts. Effective treatment of acne can decrease these negative effects.

If significant psychosocial effects are present, consider a more aggressive initial treatment (such as combination therapy and closer follow-up) than might be indicated by the severity of the acne alone. The patient's perception of improvement is the best measure of successful treatment.

5. Choose Treatment Plan

There are multiple options that have been effective in treating acne. When initiating treatment, it is important to consider treatment goals, which should include:

- Clearing the acne
- Preventing scarring
- Learning to cope with psychological stress resulting from the acne

Considerations:

- Patient skin type (oily to dry)
 - For very oily skin, consider a gel or solution
 - For very dry skin, choose creams or lotions
- If more than one topical is being used, have patient apply one in the morning and the other at night.
- If multiple agents are used, they should be from different classes, for example, a benzoyl peroxide and a topical antibiotic.
- Customize treatment to enhance patient adherence. For example, can the patient reach his/her back to apply the product? Emphasize importance of avoiding food, especially dairy products, one hour before or two hours after taking tetracycline (*an antibiotic*).

a. Topical Treatment of Acne

One way to treat mild acne may include benzoyl peroxide, a topical antibiotic, or a combination product one to two times daily; or a topical retinoid once daily in addition to the above. See tables in this note for description of medications.

Over-the-counter Topical Products

A wide variety of over-the-counter (OTC) topical products are available to the patient for self-treatment of acne. A complete listing is beyond the scope of this publication. The most common ingredient in OTC products is benzoyl peroxide in concentrations up to 10% (many of the expensive acne systems advertised contain benzoyl peroxide and offer no advantages over commercial products). Salicylic acid in concentrations of 0.5% to 2% is a keratolytic (*a peeling agent that softens and sheds the outer layer of the skin*) found in many OTC acne products. Products may also contain glycolic acid, sulfur, or resorcinol. When evaluating a new patient, it is helpful to know which products have been tried.

Benzoyl Peroxide

Benzoyl peroxide is available without a prescription in products such as Clearasil® and by prescription in the products listed below. It is also available in combination with antibiotics (see Topical Antibiotics table.)

Medication* (brand name)	Formulations	Directions	Comments
Benzoyl peroxide (Benzac®, Brevoxy, Desquam-X®, PanOxyyl®, generics)	Bar soap 5-10% Cleanser 10% Gel 2.5-20% (alcohol or water based) Liquid 2.5-10% Lotion 5-10%	Cleansers: wash one or twice daily Other: apply once or twice daily	<ul style="list-style-type: none"> • In addition to bactericidal activity against <i>P. acnes</i>,** benzoyl peroxide inhibits new comedone** formation, reduces follicular lipids** and free fatty acids, causes mild desquamation**. • Local irritation is the most frequent side effect. • Contact allergy possible but rare. • Bleaches hair and fabrics.

*Medications are listed alphabetically, not in order of preference. Brand names are included for clarity and not intended to be all-inclusive.

**Glossary:

comedone: whiteheads or blackheads

desquamation: shedding or peeling of skin

follicular lipids: fats found in the skin cavities that contain hair roots

P. acnes: propionibacterium acnes – a bacterium involved in acne

Topical Retinoids for Acne

Topical retinoids increase the turnover of follicular epithelial cells (*skin cavities that contain hair roots in the outer covering of the body*), promote drainage of comedones (*whiteheads or blackheads*) and inhibit new comedone formation. Topical retinoids are generally applied in the evening.

Topical Retinoids

Medication * (brand name)	Formulations	Dose/Directions	Comments
Adapalene (Differin®)	Cream 0.1% Gel 0.1% Solution 0.1%	Apply once daily at bedtime.	<ul style="list-style-type: none"> side effects are erythema (<i>redness</i>), dryness, burning. Minimize by applying 30-45 minutes after washing, start with lower strength formulations and consider application every 3rd or alternate nights to start. Tazarotene may be effective with short contact therapy, 5 minutes or less of contact. topical retinoids should not be used in pregnancy liquid and gel forms tend to be more drying than creams photosensitizing, sunscreen SPF 15-30 is recommended. improvement can be delayed 1-3 months after beginning therapy, some patients notice clinical worsening 2-4 weeks into treatment adapalene (Differin®) may be less irritating tazarotene (Tazorac®) tends to be more irritating new formulations (Avita® and Retin-A Micro®) are designed to be more emollient and less penetrating which may lessen irritation
Tazarotene (Tazorac®)	Cream 0.05% 0.1% Gel 0.05% 0.1%	Apply once daily in the evening.	
Tretinoin (Retin-A® generics)	Cream 0.025% 0.05% 0.1% Gel 0.01% 0.025% Liquid 0.05%	Apply once daily at bedtime.	
Tretinoin (Retin - A Micro®)	Gel 0.04% Gel 0.1% (slow release delivery system)	Apply once daily at bedtime	

*Medications are listed alphabetically, not in order of preference

Azelaic Acid

Azelaic acid is a naturally occurring decarboxylic acid that has been shown to be effective in reducing both inflammatory and non-inflammatory acne lesions.

Medication (brand name)	Formulations	Directions	Comments
Azelaic Acid (Azelex®)	Cream 20%	Apply twice daily.	<ul style="list-style-type: none"> • has both comedonal and antibacterial action • may decrease post inflammatory hyperpigmentation (<i>unusual darkening of the skin</i>) • local irritation, pruritis (<i>itching</i>) and burning may occur

Topical Antibiotics for Acne

Propionibacterium acnes (*P. acnes*) is an anaerobic (*without oxygen*) bacterium present within the pilosebaceous (*related to the oily gland*) follicles. It is thought that this microorganism plays a role in acne-associated inflammation. The antibiotics used to treat acne have been shown to reduce colonization of *P. acnes* and may also possess direct anti-inflammatory effects. *In vitro* (*outside the body*) resistance of *P. acnes* to commonly used antibiotics has been increasing but the clinical significance of this is uncertain. However, it has been recommended that antibiotics be used with either topical retinoids or benzoyl peroxide.

Medication (brand name)	Formulations Foam 1%	Directions Brand only/Pads	Comments
Clindamycin (Cleocin T®, Evoclin, generics)	Foam 1% (brand only) Gel 1% Lotion 1% Pads 1% (brand only) Solution 1%	Apply once or twice daily	<ul style="list-style-type: none"> • solution contain isopropyl alcohol and may cause excessive drying • rare case reports of pseudomembranous colitis have been reported following topical clindamycin
Erythromycin (A/T/S®, Erygel®, Eryderm®, generics)	Gel 2% Ointment 2% Pledgets 2% Solution 2%	Apply once or twice daily	<ul style="list-style-type: none"> • gel, pledgets and solution all contain isopropyl alcohol
Sulfacetamide (Klaron®)	Lotion 10%	Apply once or twice daily	<ul style="list-style-type: none"> • contraindicated in patients allergic to sulfonamides

*Medications are listed alphabetically, not in order of preference. Brand names are included for reference only and are not intended to be an all-inclusive list.

Topical Antibiotics for Acne – Combination Products

Medication * (brand name)	Formulation*	Directions	Comments
Benzoyl Peroxide 5% - Clindamycin 1%	Gel (Benazaclin®, Duac®)	Apply twice daily	<ul style="list-style-type: none"> • see comments for individual drugs • stable after dispensing for 2 months at room temperature
Benzoyl Peroxide 5% Erythromycin 3%	Gel (Benzamycin®, generics)	Apply twice daily	<ul style="list-style-type: none"> • see comments for individual drugs • stable after reconstitution for 3 months stored under refrigeration
Sulfacetamide 10% Sulfur 5%	Cream (Clenia®) Gel (Avar®, Rosula®) Lotion (Novacet R®, Sulfacet R®, generics) Wash (Clenia®, Plexion®, Rosanil®)	Apply one to three times daily.	<ul style="list-style-type: none"> • sulfur has a keratolytic action (<i>peeling</i>) action • may cause excessive dryness and irritation • contraindicated in patients with sulfonamide allergy

*Medications are listed alphabetically, not in order of preference. Brand names are included for reference only and are not intended to be an all-inclusive list.

b. Topical Treatment and Oral Antibiotics for Acne

One way to treat moderate/severe acne may include topical treatments (see Note #5a) with the addition of an oral antibiotic while continuing with the topical treatment. (See tables in this note for description of products.)

First Line Antibiotics

Medication* (brand name)	Dose	Comments
Erythromycin (Erytab®, generics)	250 to 500 mg twice daily	<ul style="list-style-type: none"> • GI upset common • Many drug interactions, including but not limited to: theophylline, digoxin, anticoagulants, lipid-lowering drugs, carbamazepine** • oral erythromycin does not have FDA indication for acne
Tetracycline	Initially 0.5 to 1 g per day in 2 divided doses, then 250 to 500 mg daily for maintenance	<ul style="list-style-type: none"> • Tetracycline must be taken on an empty stomach, 1 hour before or 2 hours after meals • Drug interactions include antacids, oral contraceptives, and anticoagulants**
Doxycycline	50 to 100 mg daily	<ul style="list-style-type: none"> • Do not use in children younger than 8 years old, or in pregnant or nursing women. • Adverse reactions include: photosensitivity (most common), GI upset, pseudotumor cerebri (<i>benign intracranial hypertension</i>)**
Minocycline (Minocin®, generics)	50 to 200 mg daily (doses greater than 10 daily are usually given in divided doses)	<ul style="list-style-type: none"> • Minocycline – abnormal pigmentation, vertigo, rarely – severe drug reaction/lupus-like reaction**

*Brand names are included for reference only and are not intended to be an all-inclusive list.

****Glossary:**

antacids: drugs that balance acids and gas in the stomach
anticoagulants: drugs used to prevent the formation of blood clots
carbamazepine: drug used to treat seizures in epilepsy
digoxin: drug used to treat heart failure and abnormal heart rhythms
intracranial: within the skull
lipid: fat in the blood and body tissue
lupus: rheumatic disease affecting skin and body tissue
photosensitivity: sensitivity to sunlight
pseudotumor cerebri: high pressure in the fluid of the brain
theophylline: drug that controls symptoms of asthma and other lung diseases
vertigo: dizziness

Second Line Antibiotics

Medication*(<i>brand name</i>)	Dose	Comments
Clindamycin (Cleocin®, generics)	150 mg once to twice daily	<ul style="list-style-type: none"> • can cause severe and potentially fatal pseudomembranous colitis.** Patients should be instructed to stop drug at the first sign of diarrhea and notify the physician • oral clindamycin is not FDA approved for treatment of acne
	400/80 mg (one single-strength tab) once to twice daily	<ul style="list-style-type: none"> • contraindicated in patients allergic to sulfonamides • common side effects include allergic skin reactions and GI disturbances • drug interactions include (but not limited to) anticoagulants, cyclosporin, sulfonyleureas** • not FDA approved for treatment of acne

*Medications are listed alphabetically, not in order of preference. Brand names are included for reference only and are not intended to be an all-inclusive list.

Other antibiotics such as azithromycin (e.g., Zmax®, Zithromax®, etc.) are being used for the treatment of acne. Studies on these antibiotics for acne are preliminary and recommendations regarding their use cannot be made at this time.

****Glossary**

anticoagulants: drugs used to prevent the formation of blood clots
cyclosporin: drug used to suppress the immune system
GI: gastrointestinal
pseudomembranous colitis: complication caused by antibiotic therapy resulting in severe inflammation of the colon
sulfonyleureas: drugs that lower blood sugar

6. Patient Education

Successful management of acne is dependent on a cooperative partnership between the health care team and the patient. Non-adherence is one of the biggest causes of treatment failure. Clear guidelines regarding treatment, possible adverse effects, and realistic expectations of treatment outcomes should be given to the patient to achieve the best possible outcome. Ongoing patient education, follow-up, encouragement, and maintaining a positive approach are vital. Because acne can be so devastating for many people, early inter-

vention with a proactive treatment plan may well prevent some of the long-term physical and psychosocial (*involving both psychological and social aspects*) consequences.

Myths and Facts

An integral component of the prevention and treatment of acne is discussion of the facts and expulsion (*forcing out*) of the myths.

MYTH: Any acne medication works immediately.

FACT: It can take at least eight weeks of a prescribed treatment regimen for the patient to see any improvement. Acne may even get worse before it gets better.

MYTH: Acne is a result of poor hygiene.

FACT: As a result of this myth, people tend to overwash their skin, often scrubbing hard with abrasive cleansers. Cleaning the skin too often may aggravate acne and cause flare-ups. Wash face twice per day with a mild soap; pat dry and use appropriate acne treatment. Acne is not caused by dirt or surface oil.

MYTH: Washing many times a day will diminish acne.

FACT: Under normal circumstances, wash no more than two times a day with mild soap and lukewarm (not very hot or very cold) water.

MYTH: Washing with abrasive soaps, cleansing granules, astringents, vigorous scrubbing or a buff puff will clear up acne on the face.

FACT: Using your fingertips or a soft washcloth is best.

MYTH: Picking your acne will make it go away.

FACT: This may cause scarring. Do not pick at acne lesions (*damaged areas of tissue*).

MYTH: Once acne has cleared up, it will be gone forever.

FACT: There is no cure for acne. If acne medication is discontinued, acne will probably flare up.

MYTH: Stress causes acne.

FACT: Stress alone does not cause acne but may make psychological reaction to the acne worse. Acne is caused by overactive oil glands stimulated by androgens (*male hormones*) mixing with dead skin cells. This is particularly true during the teenage years when androgen production is at its highest.

MYTH: Eating chocolate and sugar will cause acne.

FACT: There is no evidence to support this. Certain foods may make some patients' acne worse, and obviously should be avoided. No specific food has been proven to worsen acne. No diet has been shown to be beneficial.

MYTH: Teenagers are the only ones affected by acne.

FACT: Acne affects adults as well as children. The body produces androgens (*male hormones*) throughout life. The circumstances around adult acne may be a little different than in teens, particularly in women. Women between 18 and 40 years may have breakouts that occur most frequently when they are premenstrual (*just before menstruation*).

Home care recommendations

- Topical medications should be applied to dry skin.
- Try to avoid abrasive soaps, cleansing granules, astringents, and vigorous scrubbing.
- Under normal circumstances, wash no more than two times a day with your fingertips or a soft washcloth.

- Patients who are treated with acne medications often develop dry skin. Use fragrance-free, noncomedogenic (*not likely to cause whiteheads or blackheads*), oil-free moisturizers. These moisturizers will not clog pores and therefore should not cause blackheads or whiteheads.
- For patients who choose to use makeup to cover their acne lesions, a water-based, noncomedogenic (*not likely to cause whiteheads or blackheads*) makeup should be used. Avoid oil-based cosmetics. Use makeup sparingly.
- Do not cover acne with bandages or tight fitting clothing.
- If topical retinoids (*substances that regulate growth of skin, lung, and gut cells*) or photosensitizing antibiotics (*antibiotics that increase sensitivity to sunlight*) are prescribed, recommend staying out of the sun as much as possible and stress the use of sunscreens.

7. Follow-Up 6-12 Weeks/Satisfactory Response?

There is no clear evidence to support a specific duration of any treatment for acne. However, clinical experience and clinical trials suggest that a minimum treatment period of 6-12 weeks is needed before an improvement will be noted in most patients.

8. Assess Outcome and Adherence

Asking non-threatening, open-ended questions during patient interviews can be a useful method of assessing medication adherence. The interview should include probes for factors that contribute to non-adherence including adverse reactions, misunderstandings of asymptomatic (*without symptoms*) or chronic disease treatment, depression, cognitive impairment (*deficiency in the ability to think, reason, or remember*), complex dosing regimens, and financial constraints.

- a. Assess the patient's knowledge of his/her medication and medical condition:

"Can you explain why you are using this medication?"

"How do you use your medication (with food or on an empty stomach; in the morning or the evening)?"

- b. Assess the patient's medication administration process:

"Many patients have difficulty remembering to use their medication. From what you recall, have you ever had trouble remembering to use your medications?"

"How do you remember to use your medication each day? Do you use a reminder device such as a pill box or alarm?"

- c. Assess the patient's barriers to adherence:

"What is the most difficult task for you in reaching your treatment goal?"

"Are you comfortable with your ability to follow the treatment plan that we have designed for you?"

"Are you experiencing any unusual symptoms that you fear may be due to your medication?"

"Is the cost of your medications interfering with your treatment?"

9. Modify Treatment Plan

Consider different/additional medications

It may be necessary to switch to a different class of topical acne medication. For example: if the patient is on a benzoyl peroxide product or a combination product and is not responding, consider switching to a once daily topical retinoid, and a once daily topical anti-infective (*agent that fights infections*). For moderate to severe acne, consider adding an oral antibiotic or changing the current oral antibiotic.

Consider adjunctive (*additional*) therapy

- **Oral contraceptives**

Treatment with a combined oral contraceptive (estrogen and progestin) is an alternative for women who fail conventional acne therapies. The estrogen component of combined oral contraceptives reduces androgen production. Progestin-only oral contraceptives, on the other hand, are not effective and may worsen acne.

Responses may not be seen for 3-6 months, with some patients showing a flare-up of symptoms during early cycles. To ensure adherence with the therapy, the ideal product is one that has the lowest incidence of adverse effects for a particular patient. Products with FDA indications for acne include Estrostep® and Ortho Tri-cyclen®.

- **Spirolactone**

Spirolactone is a medication primarily used in the treatment of hypertension (*high blood pressure*). Due to its effect on lowering androgens (*male hormones*), it has occasionally been used to treat adult-onset acne in women when other treatments have been ineffective. It is the effects of testosterone that are felt to be a contributing factor to the development of acne in adult females. The drug acts by blocking the effects of testosterone on the oil glands and hair follicles of the female patient. The result is a reduction in oil production that may lead to improvement of their acne. The optimal dosage varies, but ranges from 50 to 200 mg daily. Response may take 2-3 months. The drug should not be used during pregnancy. Women of child-bearing age should use birth control methods while taking the medication. Side effects are rare, usually related to menstrual irregularity, mild GI (*gastrointestinal*) upset, or headache. The medication may be taken for one to two years with periodic "drug vacations."

Spirolactone can cause decreased sodium and increased potassium. Blood tests should be done to carefully monitor the levels of sodium and potassium.

- **Oral retinoids**

Isotretinoin (Accutane®,) is the only oral retinoid approved for use in acne and is a well-established teratogen (an agent, such as a virus or drug that causes birth defects). Although it has not been determined whether Isotretinoin (Accutane®,) causes depression or suicide, this is an ongoing concern. For these reasons, this drug is highly regulated by the FDA.

Only providers registered with the iPLEDGE program may prescribe Isotretinoin (Accutane®,). For information about this program conduct an internet search using: iPLEDGE program. This program is scheduled to begin March 1, 2006 and will replace the existing System to Manage Accutane Related Teratogenicity (*the ability of an agent, such as a virus or drug to cause birth defects*) (S.M.A.R.T) program.

- **Intra-lesional injections**

There are rare circumstances in which you may consider injecting large acne cysts with a corticosteroid for short-term cosmetic improvement. Each injection carries a risk of causing skin atrophy (*loss of*

muscle tissue). Repeated injections are not recommended. The concentration of triamcinolone varies from 2-10 mg/cc. The stock 10-, 25-, or 40-mg/ml steroid suspension should be diluted with lidocaine and only enough should be injected through a 1-ml syringe with a 27- or 30-gauge needle to distend the cyst slightly (usually 0.025 ml to 0.1 ml).

- **Light Therapy**

There continue to be numerous studies about light treatment for acne, including blue light and photodynamic therapy with and without pretreatment with topical medications. At this time, the evidence is inadequate to make a recommendation about the effectiveness and safety of these treatments.

Consider dermatology referral

Dermatologists treat all forms of acne, particularly severe cases. For those patients with severe inflammatory acne that has not improved with previously described medications, a retinoid – isotretinoin (Accutane) – may be considered. Dermatologists may be helpful in guiding to guide you at any point of the flowchart.

10. Maintenance

If stable on current topicals, continue treatment indefinitely. If stable on topical and systemic antibiotics, after clearance is achieved for 1 to 3 months, consider decreasing oral antibiotics and continuing topicals indefinitely.

Appendix A – Glossary of Terms

A

acne vulgaris: the most common form of acne

adjunctive: additional

adrenal tumor: tumor on the adrenal gland, an organ that produces various hormones

anaerobic: absence of oxygen

androgen: a masculine hormone, found in both men and women

antacids: drugs that balance acids and gas in the stomach

antibiotic: drug that eliminates bacteria that causes infection

anticoagulants: drugs used to prevent the formation of blood clots

anti-infective: agent that fights infections

arthralgias: joint pain

asymptomatic: without symptoms

atrophy: loss of tissue

B

bacterium: microorganism that may cause infection or disease

C

carbamazepine: drug used to treat seizures in epilepsy

chelitis: chapped lips

closed comedone: whitehead; non-inflamed follicular opening containing a plug with a thin overlying epidermal membrane

cognitive impairment: deficiency in the ability to think, reason, or remember

corticosteroids: steroid hormone with anti-inflammatory and immunosuppressive properties

cyclosporin: drug used to suppress the immune system

cystic recalcitrant nodular acne: tender, inflamed masses in the skin that are resistant to treatment

D

desquamation: shedding or peeling of skin

digoxin: drug used to treat heart failure and abnormal heart rhythms

E

emollient: substance that soothes and softens the skin

epidermal: related to the outermost layer of the skin

epithelial: outer covering of the body or organs

erythema: redness of the skin

expulsion: forcing out

F

follicular: related to the follicles, the skin cavities that contain hair roots

folliculitis: inflammation of the hair follicles due to an infection or irritation

G

GI: gastrointestinal – pertaining to the stomach and intestines

H

hirsutism: excessive hairiness

hyperpigmentation: unusual darkening of the skin

I

in vitro: outside the body

indurated: hardened

inflammatory: injury of body tissue characterized by pain, swelling, redness, and heat

intracranial: within the skull

K

keratolytic: a peeling agent that softens and sheds the outer layer of the skin

keratotic: crusty patch on the skin caused by excessive sun exposure

L

lesion: damaged area of tissue

lipid-lowering: drugs that lower fats in blood and body tissues

lupus: rheumatic disease affecting skin and body tissue, characterized by joint pain, stiffness, inflammation, and skin rashes

M

marginated: distinctive margin or boundary

N

nodule/cyst: poorly marginated, red, tender, sometimes draining, hardened mass in the skin

noncomedogenic: not likely to cause whiteheads or blackheads

O

occlusion: obstruction

open comedone: blackhead; a non-inflamed follicular opening containing a plug that appears black

OTC: over-the-counter

ovarian tumor: tumor on the ovary, the female reproductive organ

P

P. acnes: propionibacterium acnes – a bacterium involved in acne

papule: small round to oval red elevation of the skin

photosensitivity: sensitivity to sunlight

photosensitizing: increasing the sensitivity to sunlight

pilosebaceous: related to a hair follicle and its oily gland

pituitary tumor: tumor on the pituitary gland, the master gland of the body

pledget: small plug

polycystic ovary disease: disorder characterized by irregular or absent menstrual cycle, obesity, adult acne, excess facial hair, and/or diabetes

precocious puberty: sexual characteristics at an early age

premenstrual: just before menstruation

propionibacterium acnes: P. Acnes – a bacterium involved in acnes

pruritus: medical term for itching

pseudomembranous colitis: complication caused by antibiotic therapy resulting in severe inflammation of the colon

pseudotumor cerebri: also called idiopathic intracranial hypertension – high pressure in the fluid of the brain

psychosocial: involving both psychological and social aspects

pustule: a papule with a central pocket of pus

R

recalcitrant: resistant to treatment

resorcinol: substance used in acne ointments and dandruff shampoos

retinoid: substance that regulates growth of skin, lung, and gut cells

rosacea: common skin condition characterized by redness, pimples, and broken blood vessels

S

sebum: the skin's natural oil

sulfonylureas: drugs that lower blood sugar

T

teratogenicity: causing birth defects

tetracycline: an antibiotic

theophylline: drug that controls symptoms of asthma and other lung diseases

V

vertigo: dizziness

Website Resources

A number of websites provide more in-depth information on acne management. The table below includes details.

Website Sponsor	Description	Website Address
American Academy of Dermatology	Practical definition of acne, products to use, treatment.	http://www.aad.org
Arboris, Ltd.	Brief description of symptoms, causes, treatment, and prevention of acne.	http://www.medinfo.co.uk/conditions/acne.html
Health on the Net Foundation	Managing acne, definitions, causes and treatment.	http://www.webmd.com
McKinley Health Center University of Illinois	Description of symptoms, treatment, duration of acne outbreaks.	http://www.mckinley.uiuc.edu/health-info/disond/misc/acne.html
National Institutes of Health	Definition and treatment of acne; questions and answers.	http://www.niams.nih.gov/hi/topics/acne/acne.htm
Roche Pharmaceuticals	Information on managing acne, facts, and myths.	http://www.facefacts.com
Center for Drug Evaluation Research	Information on isotretinoin (Accutane®) therapy	http://www.ipledgeprogram.com