

# Acne Vulgaris: Adult & Pediatric

## Skin and Integumentary

### Clinical Decision Tools for RNs with Additional Authorized Practice [RN(AAP)s]

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## Background

Acne vulgaris is a chronic inflammatory disease of the sebaceous glands and accompanying hair follicle (Winland-Brown & Porter, 2019). Acne lesions include comedones, papules, nodules, and cysts (Winland-Brown & Porter, 2019). Although not life threatening, acne may have serious psychological effects on adolescents and adults (Winland-Brown & Porter, 2019). Acne involves the sebaceous follicles (sebaceous glands emptying into hair follicles) typically stimulated at puberty by increasing levels of androgen (Winland-Brown & Porter, 2019). These follicles produce greater amounts of sebum (oil), which combines with keratin from the lining of the follicle to form plugs called comedones (Winland-Brown & Porter, 2019). Bacteria, specifically *Propionibacterium acnes*, invade the comedones and produce lipase, which breaks down the sebum into free fatty acids (Winland-Brown & Porter, 2019). These compounds cause inflammation and subsequent rupture of the follicle (Winland-Brown & Porter, 2019).

## Immediate Consultation Requirements

The RN(AAP) should seek immediate consultation from a physician/NP when any of the following circumstances exist:

- The client is a child under the age of seven. They do not normally produce significant levels of adrenal or gonadal androgens, therefore acne in this age group is rare. If acne in this age group does occur, an endocrine abnormality should be suspected requiring referral to a pediatric endocrinologist to rule out adrenal or gonadal/ovarian pathology, including the presence of androgen-secreting tumors.
- The client is a child seven to ≤ 12 years of age and has not responded to non-pharmacological interventions (Interprofessional Advisory Group [IPAG], personal communication, July 19, 2019; Zaenglein et al., 2016).

## Predisposing and Risk Factors

The development of acne vulgaris is influenced by the following:

- genetics,
- hormonal changes,
- mechanical factors (e.g., manipulation of lesions, rubbing of face),
- diet (high glycemic),
- emotions (stress, anxiety), or
- drugs (e.g., corticosteroids, testosterone) (Winland-Brown & Porter, 2019).

## Health History and Physical Exam

### Subjective Findings

Clients typically present with the following complaints, which may include the following:

- lesions on face, chest, and/or back;
- positive family history of acne; and/or
- psychological effects, including embarrassment, and social withdrawal (Winland-Brown & Porter, 2019).

### Objective Findings

Clients with acne may present with the following signs and symptoms:

Comedones	Papules and Pustules (inflammatory lesions)	Nodules and Cysts (inflammatory lesions)
<p>Open Comedones (Blackheads)</p> <ul style="list-style-type: none"> <li>• epithelium-lined sacs filled with keratin and lipids with a widely dilated orifice;</li> <li>• cylindrical, 1-3 mm in length;</li> <li>• black color because of melanin pigment in the dermis and exposure to air (which causes discolouration of lipids and melanin); colour is not due to dirt.</li> </ul> <p>Closed Comedones (Whiteheads)</p> <ul style="list-style-type: none"> <li>• precursor to inflammatory lesions;</li> <li>• small, flask-shaped, white or skin-colored, slightly elevated papules just beneath the surface of the skin.</li> </ul>	<p>Papules</p> <ul style="list-style-type: none"> <li>• develop from obstructed follicles that become inflamed.</li> </ul> <p>Pustules</p> <ul style="list-style-type: none"> <li>• larger lesions,</li> <li>• more inflamed than papules,</li> <li>• may be superficial or deep, and</li> <li>• may contain a small amount of white pus-like material.</li> </ul>	<p>Nodules</p> <ul style="list-style-type: none"> <li>• form when deep pustules rupture and form abscesses.</li> </ul> <p>Cysts</p> <ul style="list-style-type: none"> <li>• the product of pustules or nodules and are seen in more severe cases;</li> <li>• are prone to re-inflammation, and may scar on healing.</li> </ul>

(Winland-Brown & Porter, 2019)

## Differential Diagnosis

The following should be considered as part of the differential diagnosis:

- acne rosacea,
- angiofibromas,
- corticosteroid induced acne,
- flat warts,
- keratosis pilaris,
- milia,
- perioral dermatitis,
- syringoma,
- folliculitis,
- perioral dermatitis,
- pseudofolliculitis barbae,
- tinea faciei,
- molluscum contagiosum, or
- polycystic ovarian syndrome (Winland-Brown & Porter, 2019).

## Making the Diagnosis

Diagnosis is usually made by history and clinical assessment. Diagnosis of acne vulgaris using the *Management of Acne: Canadian Clinical Practice Guideline* (Asai et al., 2016) is as follows:

- Comedonal acne, closed and open comedones are present.
- Mild-to-moderate papulopustular acne includes both comedones and inflammatory lesions. The inflammatory lesions are mostly superficial and include papules and pustules.
- Severe acne reveals inflammatory lesions comprised of larger or more extensive papules, pustules, and/or presence of nodules, these may be painful, and may extend over large areas leading to tissue destruction.

## Investigations and Diagnostic Tests

Not routinely recommended.

## Management and Interventions

### Goals of Treatment

The primary goals of immediate treatment are to:

- reduce sebum production;
- prevent the formation of microcomedones;
- suppress *Propionibacterium acnes*;
- reduce inflammation to prevent scarring; and

## Skin | Acne Vulgaris - Adult & Pediatric

- address psychological effects, including embarrassment, and social withdrawal (Winland-Brown & Porter, 2019).

### Non-Pharmacological Interventions

The RN(AAP) should recommend, as appropriate, the following non-pharmacological interventions:

- use of mild soaps (e.g., Aveeno or Dove) or soapless cleansers (e.g., Spectro Gel or Cetaphil),
- consider implementation of a low glycemic diet (refer to Appendix), and
- have the client complete an acne quality of life assessment (e.g., Acne-Q4 or CADI) (Burleigh, Yousefi, & Humphrey, 2018; Rx Files Academic Detailing Program, 2021; Winland-Brown & Porter, 2019).

<b>Pediatric (&lt; 7 years of age)</b>
Consult immediately (see Immediate Consultation Requirements).
<b>Pediatric (≥ 7 to &lt; 12 years of age)</b>
Use non-pharmacological interventions only (see Immediate Consultation Requirements for referral for non-responders).

### Pharmacological Interventions

The pharmacological interventions recommended for the treatment of acne vulgaris are in accordance with the *Management of Acne: Canadian Clinical Practice Guideline* (Asai et al., 2016) and the *RxFiles Drug Comparison Charts* (RxFiles Academic Detailing Program, 2021).

Interventions depend on the severity of acne; previously tried therapies (consider efficacy and tolerance); client skin type; type of vehicle's practicality (frequency of application; location of acne); and cost. Consider early aggressive treatment to prevent scarring for those at high risk (e.g., family history of severe acne).

General principles when choosing topical therapy include:

- use a solution or gel for oily skin types, however it is best to use a cream or lotion for dry or sensitive skin types;
- be aware that the potency of drug varies based on the vehicle (e.g., solutions have greater potency than gels, which have greater potency than creams and lotions); and
- be aware that the product must be applied to the entire affected area, not just individual lesions.

**First Line**

	Drug	Dose	Route	Frequency	Duration
<b>Pediatric (≥ 12 years of age) and Adult</b>					
	Benzoyl peroxide (BPO) 2.5% or 5% gel	apply to affected areas	topical	qhs or b.i.d.	up to 3 months
OR	Adapalene 0.1% (topical retinoid)	apply to affected areas	topical	qhs	up to 3 months
OR	Tretinoin 0.05% lotion (topical retinoid)	apply to affected areas	topical	qhs	up to 3 months
OR	Tazarotene 0.1% cream (topical retinoid)	apply to affected areas	topical	qhs	up to 3 months
OR	fixed-dose combination of BPO and topical retinoid e.g., Tactupump	apply to affected areas	topical	qhs	8-10 weeks
OR	fixed-dose combo of Clindamycin and Tretinoin e.g., Biacna	apply to affected areas	topical	qhs	8-10 weeks
OR	combined oral contraceptive	one tablet	p.o.	once daily for 21/7 and placebo for 7/7	ongoing as tolerated

**Second Line**

Antibiotics can be added to first line therapy for moderate to severe acne. Avoid use of oral antibiotics alone due to the development of antibiotic resistance. The higher dose is prescribed until improvement is noted and then reduced to the maintenance dose.

	Drug	Dose	Route	Frequency	Duration
<b>Pediatric (≥ 12 years of age) and Adult</b>					
	Tetracycline	500 mg initially, and then 250 mg-500 mg	p.o. before meals	b.i.d. until improvement is observed, then once daily at lowest effective dose	to not exceed 12 weeks at any given time
OR	Doxycycline	100 mg	p.o.	once daily	to not exceed 12 weeks at any given time

## Client and Caregiver Education

The RN(AAP) provides client and caregiver education as follows:

- Counsel about appropriate use of medications (dose, frequency, compliance, etc.), recognizing that adherence improves with minimized dosing frequency.
- Advise to discontinue acnegenic moisturizer/substances, manual manipulation of lesions, and astringents and scrubs.
- Advise to use oil free makeup, shave area lightly, once only, and to follow the grain of hair growth, and cleanse affected areas once daily and no more than two times per day.
- Advise to consider relaxation techniques for stress reduction.
- Advise that acne may worsen temporarily during the first two to three weeks of treatment and that all treatments require four to six weeks before they are effective.
- Advise that topical agents may be irritating.
- Advise that topical agents are preventive and do not diminish existing lesions.
- Provide education about the "myths" of acne (e.g., not related to junk food or poor hygiene).
- Provide or arrange for counselling if depression, social withdrawal, or bullying are present. (Burleigh, Yousefi, & Humphrey, 2018; Rx Files Academic Detailing Program, 2021; Winland-Brown & Porter, 2019).

## Monitoring and Follow-up

The RN(AAP) should:

- advise the client to be reassessed every two or three weeks at the beginning of treatment to encourage compliance and monitor the efficacy of interventions.
- consult with a physician/NP if no improvement after 12 weeks of therapy.

## Complications

The following complications may occur:

- scarring,
- pain,
- hyper-pigmentation of affected areas of the skin,
- altered self-esteem affecting social life, and
- depressive disorder (Winland-Brown & Porter, 2019).

## Referral

Refer to a physician/NP if client presentation is consistent with those identified in the *Immediate Consultation Requirements* section, if there is a failure to respond to therapies for mild to moderate acne, or if the client presents with severe disease. Referral to a dermatologist may be warranted in severe cases and those unresponsive to recommended treatments (IPAG, personal communication July 19, 2019).

## References

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## Appendix

### Glycemic Index

- The glycemic index (GI) measures how a carbohydrate-containing food raises blood glucose. Foods are classified based on how they equate to a reference food such as glucose or white bread.
- Foods with a high GI raise blood glucose more than one with a medium or low GI.
- Examples of carbohydrate-containing foods with a low GI include dried beans and legumes, all non-starchy vegetables, some starchy vegetables like sweet potatoes, most fruit, and many whole grain breads and cereals including barley, whole wheat bread, rye bread, and all-bran cereal.
- Foods that do not contain carbohydrates, like meats and fats, don't have a GI.
- The GI is expressed as a percentage of the value for glucose with low GI foods having a percentage of 55 or less, whereas medium GI foods are 56-69 and high GI foods are 70% or more.
- Fat and fiber tend to decrease the GI of a food.
- Other factors that can affect the GI of a food include ripeness and storage time (the riper a fruit or vegetable is, the higher the GI), processing (juice has a higher GI than whole fruit), cooking method (al dente pasta has a lower GI than soft-cooked pasta), variety (converted long-grain white rice has a lower GI than brown rice). (Diabetes Canada, 2018)