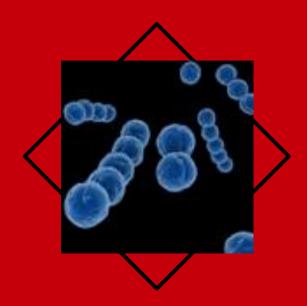
Scarlet Fever



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Objectives

- Discuss background, risk factors, signs and symptoms, diagnosis, and complications of scarlet fever
- Discuss 3 conventional therapeutic options for scarlet fever
- Discuss 4 conventional therapeutic options for scarlet fever symptoms
- Discuss 13 integrative therapies studied for the treatment and/or prevention of bacterial infections
- Discuss patient case and identify symptoms, diagnosis, and treatment options as it pertains to patient case

Disclaimer

- ◆ This webinar is intended for informational purposes only and should not be interpreted as specific medical advice. A qualified healthcare provider should be consulted before making decisions about therapies and/or health conditions.
- ◆ While some complementary and alternative techniques have been studied scientifically, high-quality data regarding safety, effectiveness, and mechanism of action are limited or controversial for most therapies.
- ◆ Whenever possible, it is recommended that practitioners be licensed by recognized professional organizations that adhere to clearly published standards. In addition, before starting a new technique or engaging a practitioner, it is recommended that patients speak with their primary healthcare providers.
- ◆ Potential benefits, risks (including financial costs), and alternatives should be carefully considered. The following webinar is designed to provide historical background and an overview of clinically oriented research and neither advocates for or against the use of a particular therapy.

Introduction

- Also known as scarlatina
- Bacterial infection caused by Group A
 Streptococcus (Streptococcus pyogenes)
- Children under 18 years of age; mainly 5-15
- Rare in adults
- May resolve in approximately 10 days if treated with antibiotics
- May result in rare but serious complications (ex/ rheumatic fever) if untreated

Risk Factors

- Age: children, 5-15 years old
- Outbreaks of strep throat or scarlet fever in the community, neighborhood, or school

Causes

• Streptococcus pyogenes associated with strep throat

- Rarely:
 - Streptococcus pyogenes associated with impetigo
 - Uterine infection contracted during childbirth
 - Rash and fever occur without signs and symptoms of throat infection

Signs and Symptoms

- Incubation: 1-7 days; generally 2-4 days
- ◆ Fever ≥ 101 °F
- Chills
- Flushed face, with pale area around lips
- "White strawberry tongue"
 - Red, bumpy tongue with white coating
 - Beginning of illness
- Red, sore throat
 - May or may not have white or yellow patches
 - → difficulty swallowing
 - Swollen, tender glands in the neck

Signs and Symptoms

Rash

- First appears 12-48 hours after fever begins
 - Face, neck, upper chest
 - Tiny, red pinpoints
 - Lasts 2-5 days, usually not serious
- May spread over body within hours to days
- Appearance of sunburn, feels like sandpaper
- May be itchy, but usually not painful
- Skin on fingertips and toes may peel after rash disappears

Complications

- Glomerulonephritis
 - Kidney damage
- Meningitis
 - ♦ Very serious
 - May result in brain damage or death without treatment
- Rheumatic Fever
 - Affects various organs and systems (heart, joints, skin, nervous system)
 - Very unlikely with appropriate antibiotic treatment for strep bacteria

Diagnosis

- Symptoms
- Throat culture
 - Confirmation of Group A streptococcus
 - Swab of throat
 - Results in approximately two days
- Rapid Antigen Test
 - Results 15 minutes
 - Less accurate
- Rapid DNA test
 - Results in one day
 - Accurate

Conventional Therapies

- Antibiotics
 - Drug of choice:
 - Oral penicillin or amoxicillin x 10 days
 - Penicillin allergy: erythromycin
 - Side effects:
 - Mild stomach cramps/upset
 - Nausea
 - Vomiting
 - Diarrhea

Conventional Therapies

- Fluids
 - Keeps throat moist
 - Prevents dehydration
 - If painful swallowing, may use soothing foods
 - Soup
 - Ice cream
 - Popsicles
- Moist, warm towel applied to neck

Conventional Therapies

- Over-the-counter medications
 - Reduce fever and throat pain:
 - ◆ Ibuprofen (Motrin®, Advil®)
 - ◆ Acetaminophen (Tylenol®)
 - Relieve sore throat:
 - ◆ Chloraseptic spray (children > 3 years of age)
 - * Do NOT use if allergic to local anesthetics (benzocaine)
 - ◆ AVOID Aspirin due to incidence of Reye's Syndrome

- There is currently limited available evidence on the use of integrative therapies for the prevention/treatment of scarlet fever
- The following integrative therapies have been studied for use in various bacterial infections, should be used only under the supervision of a qualified healthcare provider, and should not be used in replacement of other proven therapies of preventive measures

Grading Criteria

Grade	Scientific Evidence		
A	Strong		
В	Good		
C	Unclear or Conflicting		
D	Fair Negative (may not work)		
F	Strong Negative (likely does not work)		

Natural Standard evidence-based validated grading rationale™

- · Grades reflect the level of available scientific evidence in support of the efficacy of a given therapy for a specific indication.
- Expert opinion and folkloric precedent are not included in this assessment, and are reflected in a separate section of each monograph ("Strength of Expert Opinion and Historic/Folkloric Precedent").
- . Evidence of harm is considered separately; the below grades apply only to evidence of benefit.

Level of Evidence Grade	Criteria	
A (Strong Scientific Evidence)	Statistically significant evidence of benefit from >2 properly randomized trials (RCTs), OR evidence from one properly conducted RCT AND one properly conducted meta-analysis, OR evidence from multiple RCTs with a clear majority of the properly conducted trials showing statistically significant evidence of benefit AND with supporting evidence in basic science, animal studies, or theory.	
B (Good Scientific Evidence)	Statistically significant evidence of benefit from 1-2 properly randomized trials, OR evidence of benefit from >1 properly conducted meta-analysis OR evidence of benefit from >1 cohort/case-control/non-randomized trials AND with supporting evidence in basic science, animal studies, or theory. This grade applies to situations in which a well designed randomized controlled trial reports negative results but stands in contrast to the positive efficacy results of multiple other less well designed trials or a well designed meta-analysis, while awaiting confirmatory evidence from an additional well designed randomized controlled trial.	
C (Unclear or conflicting scientific evidence)	Evidence of benefit from ≥1 small RCT(s) without adequate size, power, statistical significance, or quality of design by objective criteria,* OR conflicting evidence from multiple RCTs without a clear majority of the properly conducted trials showing evidence of benefit or ineffectiveness, OR evidence of benefit from ≥1 cohort/case-control/non-randomized trials AND without supporting evidence in basic science, animal studies, or theory, OR evidence of efficacy only from basic science, animal studies, or theory.	
D (Fair Negative Scientific Evidence)	Statistically significant negative evidence (i.e., lack of evidence of benefit) from cohort/case-control/non-randomized trials, AND eviden in basic science, animal studies, or theory suggesting a lack of benefit. This grade also applies to situations in which >1 well designed randomized controlled trial reports negative results, notwithstanding the existence of positive efficacy results reported from other less well designed trials or a meta-analysis. (Note: if there is ≥1 negative randomized controlled trials that are well designed and highly compelling, this will result in a grade of "F" notwithstanding positive results from other less well designed studies.)	
F (Strong Negative Scientific Evidence)	Statistically significant negative evidence (i.e. lack of evidence of benefit) from ≥1 properly randomized adequately powered trial(s) of high-quality design by objective criteria.*	
Lack of Evidence [†]	Unable to evaluate efficacy due to lack of adequate available human data.	

^{*}Objective criteria are derived from validated instruments for evaluating study quality, including the 5-point scale developed by Jadad et al., in which a score below 4 is considered to indicate lesser quality methodologically (Jadad AR, Moore RA, Carroll D, Jenkinson C, Reynolds DJ, Gavaghan DJ, McQuay HJ. Assessing the quality of reports of randomized clinical trials: is bilinding necessary? Controlled Clinical Trials 1996; 17[1]:1-12).



Listed separately in monographs in the "Historical or Theoretical Uses which Lack Sufficient Evidence" section.

Grade A	Grade B	Grade C	Grade D
Probiotics	Probiotics	Probiotics Blessed thistle Cinnamon Cranberry Garlic Lavender Propolis Seaweed, kelp, bladderwrack Selenium Sorrel Hydrotherapy Prayer/distant healing	Probiotics Macrobiotic diet

Grade A: Strong Scientific Evidence Probiotics

- "Friendly germs"
- Keep harmful bacteria and yeasts in gut under control
- May reduce adverse effects of antibiotics in the intestinal environment
- Reduced growth of *Clostridium difficile*
- May prevent antibiotic resistance
- Food sources, especially milk products

Grade A: Strong Scientific Evidence <u>Probiotics</u>

- Can be taken as capsules, tablets, beverages, powders, yogurts, and other foods
- Safe, well-tolerated
- Precautions:
 - Avoid if allergic/hypersensitive to probiotics
 - Use cautiously if lactose intolerant
 - Use cautiously in neonates born prematurely or with immune deficiency

Grade B: Good Scientific Evidence Probiotics

- May reduce:
 - Number of sick days
 - Frequency of respiratory tract infections
 - Frequency of related antibiotic treatments
- More research is needed

Grade C: Unclear/Conflicting Scientific Evidence <u>Probiotics</u>

- May reduce:
 - Presence of bacterial infections in the upper respiratory tract
- More research is needed

Grade C: Unclear/Conflicting Scientific Evidence Blessed Thistle

- May have affect on some types of bacterial infections
- More research in humans is needed
- Safe: orally, usual doses, short duration
- Few reported side effects with chronic use:
 - ◆ Increased bleeding◆ Skin rash
 - Increased stomachStomach irritation acid production Vomiting
 - Liver toxicity
 - Kidney toxicity

- Esophageal/nasal cancers



Grade C: Unclear/Conflicting Scientific Evidence Blessed Thistle

- Precautions:
 - ◆ Allergy → rash
 - Cross-sensitivity/reactivity
 - MugwortColtsfootSunflower

- ◆ Echinacea ◆ Daisy
- Goldenrod
- Bitter weedDandelion
- Marigold
- ◆ Blanket flower ◆ Ragweed
- Prairie Sage

- ChrysanthemumDwarf

- Asteraceae/Compositae family
- Avoid if pregnant or breastfeeding

Grade C: Unclear/Conflicting Scientific Evidence Cinnamon

- Cinnamon bark oil, the alcoholic extract, and its major components
- Antibacterial effects on the major respiratory and gastrointestinal tract pathogens:
 - ♦ Haemophilus influenzae
 - Streptococcus pyogenes
 - Porphyromonas gingivalis
 - Bacillus cereus
- More research is needed

- Streptococcus pneumoniae
- Staphylococcus aureus
- Escherichia coli

Grade C: Unclear/Conflicting Scientific Evidence Cinnamon

Avoid:

- Allergy/hypersensitivity to cinnamon, its constituents, members of the Lauraceae family, or Balsam of Peru
- Large amounts of cinnamon in pregnancy due to possible abortifacient effects

Interactions

- Antidiabetics
- Immunosuppressants
- Antiarrhythmics
- Antihypertensives
- Anticoagulants

Use Cautiously:

- Diabetes
- Autoimmune disease
 - ◆ Liver damage



Grade C: Unclear/Conflicting Scientific Evidence
Cranberry

- Limited laboratory research
- More research is needed
- Precautions
 - Avoid if allergic to
 - Cranberries
 - Blueberries
 - ◆ Vaccinum species
 - Avoid amounts higher than found in food if pregnant or breastfeeding



- Use cautiously with history of kidney stones, diabetes
- Interactions with aspirin and anticoagulants

Grade C: Unclear/Conflicting Scientific Evidence Garlic

- May have antibacterial effects
- ♦ More research is needed

Avoid:

- Allergy to garlic, any of its ingredients, other members of the Liliaceae (lily) family
- Large amounts in pregnancy due to possible bleeding and uterine contraction

Interactions

- Antidiabetics
- Immunosuppressants
- ♦ Antivirals
- Anticoagulants

- Metronidazole (Flagyl®)
- Disulfuram (Antabuse®)

Use Cautiously:

- Diabetes
- Peptic ulcer disease/ stomach irritation



Grade C: Unclear/Conflicting Scientific Evidence

Lavender



- Oils may have topical antibiotic activity
- Not well tested in humans: more research is needed
- Precautions
 - Avoid if allergic/hypersensitive to lavender
 - Avoid if pregnant or breastfeeding
 - Avoid with history of seizures, bleeding disorders, eating disorders, or anemia

Grade C: Unclear/Conflicting Scientific Evidence <u>Propolis</u>

- Created by bees
- May be beneficial for various bacterial infections
- More research is needed
- Precautions
 - Avoid if allergic/hypersensitive to:
 - Propolis
 Black poplar
 Poplar bud
 Honey
 - ◆ Bee stings/products ◆ Balsam of Peru
 - Avoid if pregnant/breastfeeding due to high alcohol content
 - ◆ May cause reversible kidney failure



Grade C: Unclear/Conflicting Scientific Evidence Seaweed, kelp, bladderwrack

- Bladderwrack may have antibacterial activity
- Research in humans is needed
- Precautions
 - Avoid if allergic/hypersensitive to:
 - ◆ Fucus vesiculosus ◆ Iodine
 - Avoid if pregnant or breastfeeding
 - Avoid with history of:
 - ◆Thyroid disease
 ★Kidney disease
 - **▶**Bleeding
 - Acne

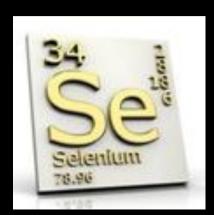
- ◆Nerve disorders
- High blood pressure



- Stroke
- Diabetes

Grade C: Unclear/Conflicting Scientific Evidence Selenium

- Found in foods like garlic, walnuts, salmon, onions
- May prevent infection
- More research is needed
- Generally regarded as safe in pregnant/breastfeeding women
- Precautions
 - Avoid if allergic/hypersensitive to selenium products
 - Avoid high doses if pregnant/breastfeeding (risk of birth defects)
 - Avoid with history of non-melanoma skin cancer



Grade C: Unclear/Conflicting Scientific Evidence Sorrel

- Not enough evidence on the proposed antibacterial effects of sorrel
- More research is needed
- Precautions
 - ◆ Large doses (due to oxalate) may cause toxicity/death
 - Avoid driving/operating machinery due to high alcohol content
 - ◆ May cause nausea/vomiting when taken with metronidazole (Flagyl®) or disulfuram (Antabuse®)
 - Avoid if pregnant/breastfeeding

Grade C: Unclear/Conflicting Scientific Evidence Hydrotherapy

- External application of water in any temperature/form
- Used for relief of various diseases/injuries and general well-being
- Examples:
 - Immersion in bath/body of water
 - Use of water jets
 - Application of wet towels
- May reduce skin bacteria
- Possible benefits in skin wounds/ulcers
- More research is needed



Grade C: Unclear/Conflicting Scientific Evidence Hydrotherapy

Avoid:

- Sudden/prolonged exposure to extreme temperatures
- Implanted medical devices
- Vigorous use of wet jets with fractures, blood clots, bleeding disorders, severe osteoporosis, open wounds, or pregnancy

Use Cautiously:

- Raynaud's disease
- Chilblains
- Acrocyanosis
- Erythrocyanosis
- Impaired temperature sensitivity
- Pregnant/breastfeeding

Grade C: Unclear/Conflicting Scientific Evidence Prayer/Distant Healing

- "Reverent petition"
- May help reduce length of hospital stay and duration of fever in infection
- Controversial; more research is needed



Grade D: Fair Negative Scientific Evidence Probiotics

- Limited evidence suggests supplementation will not reduce bacterial infection translocation
- More research is needed

Integrative Therapies

Grade D: Fair Negative Scientific Evidence Macrobiotic Diet

- Predominantly vegetarian, whole-foods diet:
 - Whole grains (especially brown rice)
 - Vegetables
 - Fruits
 - Legumes
 - Seaweeds
- Some proponents eat white meat or fish 1-2 times/week, while others eat no animal products whatsoever



Integrative Therapies

Grade D: Fair Negative Scientific Evidence <u>Macrobiotic Diet</u>

- ◆ To preserve intestinal health
- Does not reduce incidence of antibiotic resistant bacteria (compared to diet with animal products)

Avoid:

- In children without professionalguidance or supplementation
- Pregnant/lactating women

Use cautiously:

- Cancer
- Medical conditions

Integrative Therapies

Historical/theoretical (lack sufficient scientific evidence)

- Aconite
- American Paw Paw
- Belladonna
- Colloidal Silver

Prevention

- Scarlet fever can be spread through:
 - Sneezing
 - Coughing
- Appropriate hygiene
- Separate eating utensils, drinking glasses
- Wash eating utensils, drinking glasses appropriately
- Wash hands frequently

- ◆ What are some symptoms of scarlet fever?
 - ◆ Fever ≥ 101 °F
 - Chills
 - Flushed face, with pale area around lips
 - "White strawberry tongue"
 - Red, sore throat
 - Swollen, tender glands in the neck

What laboratory sign usually confirms scarlet fever?

- Group A streptococcus
- Streptococcus pyogenes

What are the conventional therapies for scarlet fever?

- Oral penicillin or amoxicillin x 10 days
- Penicillin allergy: erythromycin

- What integrative therapy has strong evidence for use in bacterial infections?
 - Probiotics
- What strong evidence does probiotics exhibit?
 - Reducing adverse effects of antibiotics in the intestinal environment
 - Keeps harmful gut bacteria/yeasts under control
 - May prevent development of antibiotic resistance

- Which of the following integrative therapies has fair negative evidence for use in bacterial infections?
 - Cranberry
 - Selenium
 - Macrobiotics
 - Prayer
 - Antibiotics
 - All of the Above

◆ TJ, an 8 year old boy, presents to his mom with a reddish colored face and tiny, pinpoint rashes on his face, neck, and upper chest. He complains of difficulty swallowing and appears to have a fever. TI's mom takes him to his primary care physician, where his temperature exceeds 101 °F. Through physical exam and Rapid DNA test, TJ is diagnosed with scarlet fever. He does not have any known allergies.

- What did TJ's doctor find in the physical exam?
 - Swollen, tender, enlarged lymph nodes
 - Red, sore throat with whitish-yellow patches
- ♦ What did TJ's doctor find from the Rapid DNA test?
 - Streptococcus pyogenes

- TJ's physician prescribes amoxicillin for 10 days. He informs TJ's mom of the side effects, including mild stomach cramps or upset, nausea, vomiting and diarrhea.
- What therapy may alleviate gastrointestinal side effects of his antibiotics and prevent harmful bacteria from proliferating?
 - Probiotics
- Where can probiotics be found?
 - Milk products, yogurt, bananas, garlic, onions
 - May also be taken as capsule, tablet, beverage, powder

- ◆ What foods can TJ's mom allow him to eat to soothe the sore throat?
 - Soup
 - Ice cream
 - Liquids
- ◆ How can TJ prevent the spread of scarlet fever?
 - Appropriate hygiene
 - Continue and complete antibiotic therapy even if his symptoms are improving

• TJ's symptoms resolve in just 2 days. He's able to return school and eat regular foods without any difficulties!

Author Information

This information has been edited and peer-reviewed by contributors to the Natural Standard Research Collaboration

(www.naturalstandard.com).

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Thank you!