

A Review on Classification, Treatment and Economic burden of Allergic rhinitis

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ABSTRACT

Objectives: A growing global public health, medical, and economic issue is allergic rhinitis (AR). To describe the Classification, management and economic burden of allergic rhinitis.

Data Sources: MEDLINE, OVID, PubMed (1950–November 2009), Research articles

Study Criteria: The publications were chosen on the basis of their suitability to the management and impact of allergic rhinitis.

Results: Despite the fact that allergic rhinitis frequently causes symptoms, its effects on patients' quality of life, and the enormous costs associated with its treatment. A burden is undoubtedly created by allergic rhinitis in context to people affected, overall costs. Additionally, it shows that a sizable majority of those suffering with allergic rhinitis did not seek physician opinion.

Conclusion: The overall financial expenses estimated to be \$3.4 billion, with nearly half of this expense being composed of prescription drugs. As a result, allergic rhinitis has a significant economic impact. There are numerous treatment alternatives, and we reviewed them to give you an update on their efficacy and any side effects that can impair patient adherence.

Keywords: Allergic rhinitis; Classification; Treatment; Economic burden.

INTRODUCTION

Allergic Rhinitis, also known as hay fever, is most common ailment.[1] The most typical allergy chronic illness is allergic rhinitis. Constant or sporadic nasal congestion, rhinorrhea, sneezing, itchy eyes and nose, overall malaise, irritability, and exhaustion are some symptoms. Worldwide, allergic rhinitis (AR) is becoming a more serious medical, economic, and public health issue.

For instance, in the United States, the population's prevalence varied from 11.9% to 30.2%.

In the United States, between 30 and 60 million people suffer from allergic rhinitis each year, with 10% to 30% of adults and up to 40% of children being affected.[3,2,4]

Medical alternatives for management of allergic rhinitis symptoms are often well-tolerated, safe, and successful in controlling symptoms. The mainstays of treatment for the disease are intranasal

corticosteroids and second-generation oral antihistamines. A side from other medications like decongestants and oral corticosteroids, allergy immunotherapy may also be effective in some circumstances.

Although it is frequently challenging to put this theory into practice, avoiding allergies is nonetheless a guiding principle. Some molecules exhibit negligible systemic absorption even with prolonged treatment in children. Currently, immunotherapy is accessible via sublingual and subcutaneous methods, mostly for people with allergic rhinitis who are unable to control their symptoms with medication and allergen avoidance. The only medication currently available that is likely to change the course of the condition is immunotherapy, which slows the progression of rhinitis to asthma as well as sensitization.[5]

In order to understand how health care resources are being used and to inform policy decisions about the control of health care costs, it is becoming more and more important to assess the economic impact of illness states, trends in drug usage, and the delivery of healthcare. The efficient use of existing resources has grown to be crucial to everyday medical practice.[6]

Despite the fact that allergic rhinitis's typical symptoms can be expensive in terms of time and money, as well as having an impact on patients' standard of living, subjects follow their prescribed medication schedules frequently because the drugs either don't work well enough to treat the symptoms or are perceived as having other drawbacks. The effectiveness of and side effects that can affect patient compliance with various treatment options for allergic rhinitis were updated.

Given that 50% of patients have complaints for over four months out of the year and 20% have symptoms for a minimum of 9 months out of the

year, it is easier to comprehend the overall impact of allergic rhinitis.

Classification

IgE-mediated allergic rhinitis is an immunological disorder caused by an exaggerated response of the immune system to allergens, such as pollen and mites present in the environment. The symptoms of IgE-mediated allergic rhinitis include sneezing, nasal congestion, rhinorrhea, and itching. The autonomic nerve system is afflicted by autonomic rhinitis. Infectious rhinitis is caused by viruses and bacteria, such as the common cold. The symptoms of infectious rhinitis include rhinorrhea, nasal congestion, sneezing, and cough. Idiopathic rhinitis is a form of rhinitis with an unknown cause. Its symptoms resemble those of IgE-mediated allergic rhinitis. However, unlike allergic rhinitis, there is no evidence of an immune system response. Treatment of idiopathic rhinitis is similar to that of allergic rhinitis, and includes avoidance strategies, lifestyle modifications, and pharmacotherapy.

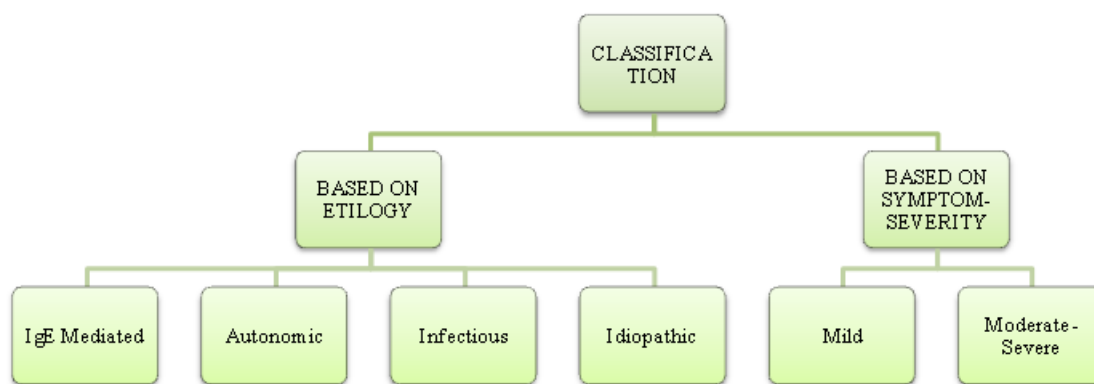


Figure 1:

In conclusion, rhinitis is a disorder that can be classified as:

Table 1: Classification based on etiology.

IgE-mediated (allergic)	<ul style="list-style-type: none"> • IgE-mediated inflammation of the nasal mucosa, resulting in eosinophilic and Th2-cell infiltration of the nasal lining. • Further classified as intermittent or persistent
Autonomic	<ul style="list-style-type: none"> • Vasomotor • Drug-induced (rhinitis medicamentosa) • Hypothyroidism • Hormonal • Non-allergic rhinitis with eosinophilia syndrome (NARES)
Infectious	<ul style="list-style-type: none"> • Precipitated by viral (most common), bacterial, or fungal infection
Idiopathic	<ul style="list-style-type: none"> • Etiology cannot be determined

Traditionally, allergic rhinitis has been categorized into two main types: seasonal and perennial. However, this classification is not always applicable as some environmental allergens may be seasonal in certain climates and perennial in others. Additionally, some patients may experience multiple allergens

which can cause symptoms to be present year-round [10]. Therefore, new methods for categorisation are being used to classify allergic rhinitis based on symptom duration (intermittent versus persistent) and severity (mild, moderate or severe) [11, 12]

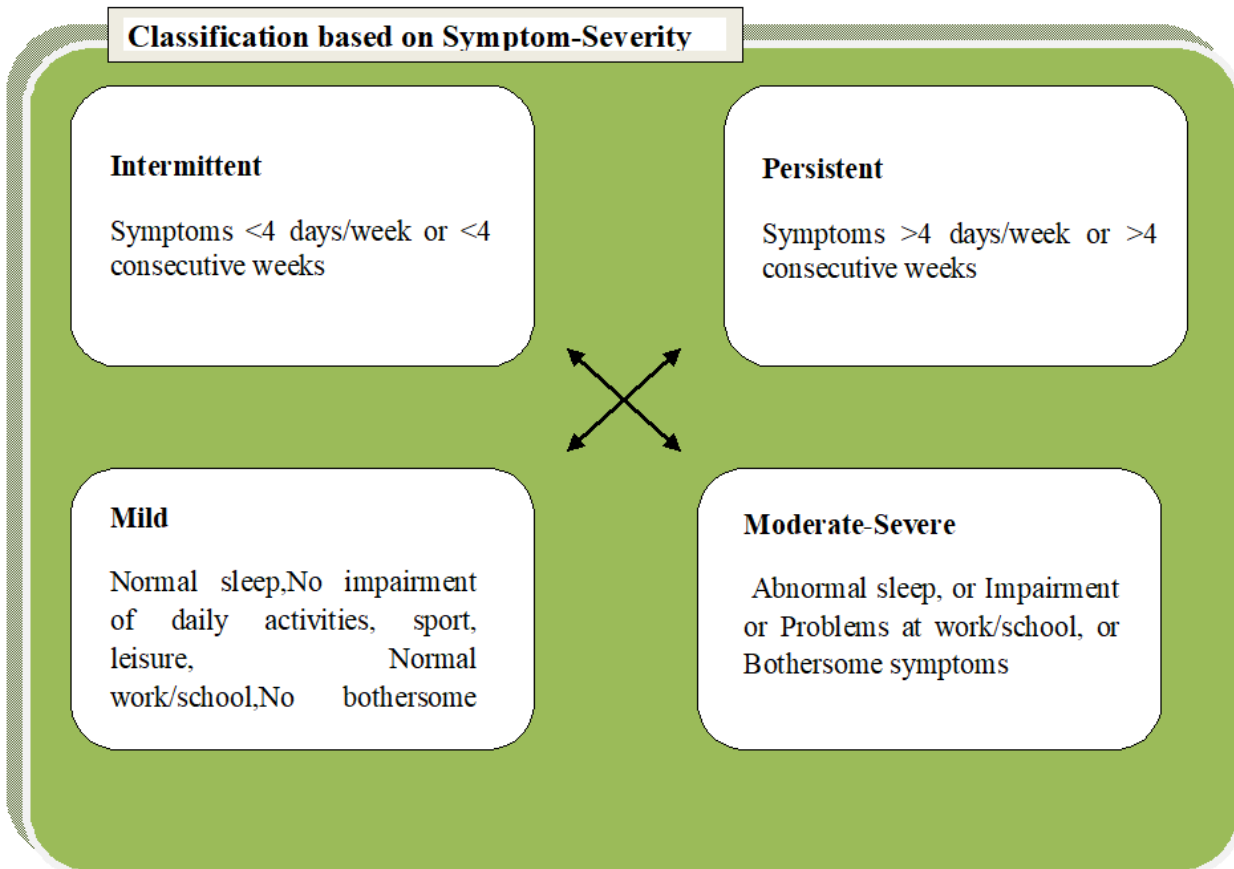


Figure 2:

Treatment

Relieving symptoms is the aim of treatment for allergic rhinitis. Leukotriene receptor antagonists (LTRAs), oral allergy medications, intranasal steroid medication, combination intranasal corticosteroid/antihistamine sprays, avoidance tactics, nasal saline irrigation, intranasal corticosteroids, and allergen immunotherapy are some of the therapeutic

alternatives available to achieve this goal. An allergist should be consulted if the patient's symptoms don't improve despite receiving the proper care. As was previously mentioned, asthma medication is an essential aspect to take into account in patients with allergic rhinitis since the two conditions seem to reflect a single airway inflammatory disease.

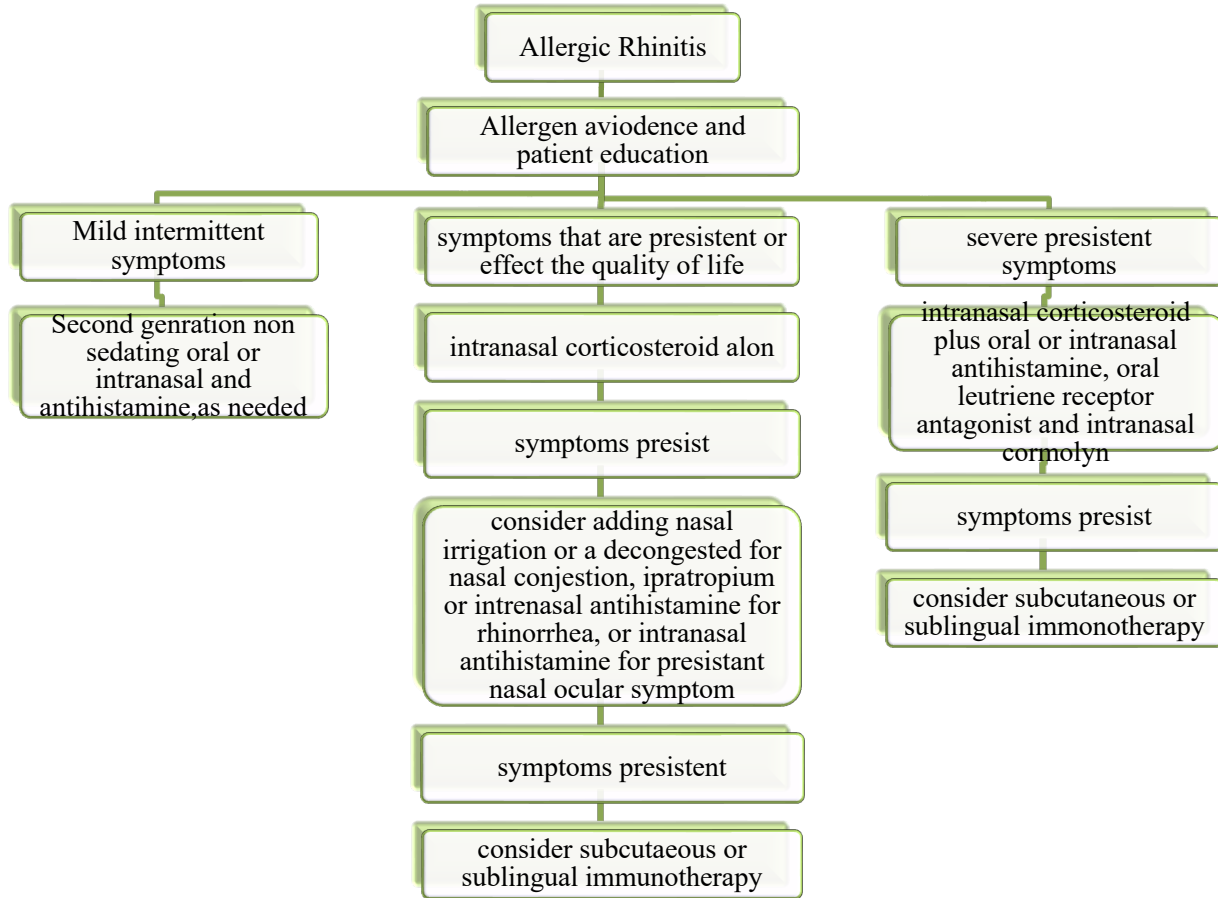


Figure 3:

Table 2: Pharmacological Treatment Of Allergic Rhinitis

Type Of Therapy	Usual Dose	Adverse Effects
Non-selective (first generation) antihistamines		
Chlorpheniramine maleate, plain	4mg daily every 6h	Constipation, vision problems, chest congestion.
Chlorpheniramine maleate, sustained release	8-12mg daily at bedtime, 8mg every 8-12 h, or 12mg every 12 h	Loss of appetite, drowsiness, nausea, dry mouth.
Clemastine fumarate	1.34mg every 8h	Dizziness, decreased coordination, excitement.
Diphenhydramine hydrochloride	25-50mg every 8h	Drowsiness, restlessness, weakness, dry mouth, headache.
Peripherally selective (second generation) antihistamines		
Loratadine	10mg once daily	Headache, nosebleed, sore throat, nervousness, difficulty falling asleep.
Fexofenadine	60mg twice daily or 180mg once daily	Headache, backache, diarrhea, coughing, rash, chills, difficulty breathing, drowsiness.
Cetirizine	5-10mg once daily	Headache, dry mouth, nausea, diarrhoea, sneezing or blocked and runny nose.
Levocetirizine	5mg in evening	Sleepiness, tiredness, weakness, fever, cough, nosebleed.

Intranasal corticosteroids		
Beclomethasone (Beconase)	1–2 sprays (50 µg/spray) EN, twice daily	Dry or sore throat, unpleasant taste and smell, sore nose, nosebleeding.
Budesonide (Rhinocort)	2 sprays (64 µg/spray) EN, once daily or 1 spray EN, twice daily	Sneezing, sore nose, nose bleeding.
Ciclesonide (Omnaris)	2 sprays (50 µg/spray) EN, once daily	Bloody mucus, sore nose, unexplained nosebleeds or a whistling sound while breathing.
Fluticasone furoate (Avamys)	2 sprays (27.5 µg/spray) EN, once daily	Darkening of the skin, diarrhea, dizziness, fainting, loss of appetite, mental depression, nausea, skin rash, weakness, vomiting.
Fluticasone propionate (Flonase)	2 sprays (50 µg/spray) EN, once daily or every 12 h (for severe rhinitis)	Darkening of the skin, diarrhea, dizziness, fainting, loss of appetite, mental depression, nausea, skin rash, weakness, vomiting.
Mometasone furoate (Nasonex)	2 sprays (50 µg/spray) EN, once daily	Headache, unpleasant taste or smell, sneezing, nosebleeds, sore nose, sore throat.
Triamcinolone acetonide (Nasacort)	2 sprays (55 µg/spray) EN, once daily	Darkening of the skin, diarrhea, dizziness, fainting, loss of appetite, mental depression, nausea, skin rash, weakness, vomiting.
Flunisolide	2 sprays (25mcg/spray) EN, once daily	Headache, nasal irritation, burning, stuffiness or soreness.
Oral decongestants		
Pseudoephedrine, plain	60 mg every 4-6 h	Feeling sick, rashes, restlessness. Sleepiness.
Pseudoephedrine, sustained release	120 mg every 12 h	Nervousness, headache, shaking, blurred vision.
Phenylephrine	10-12 mg every 4 h	Nervousness, sweating, heart burn, fainting, itching.
Combination intranasal corticosteroid/antihistamine nasal spray		
Fluticasone propionate/azelastine hydrochloride (Dymista)	1 spray EN, twice daily	Nosebleeds, congestion, chills, cold, cough, sore throat.
Leukotriene receptor antagonists		
Montelukast	1 tablet (10 mg), once daily	Upper respiratory infection, fever, headache, sore throat, cough, diarrhea.
Immunotherapy		
Sublingual Grastek (timothy grass pollen extract)	-	Mild mouth/eye/ear/throat itching, sore throat, cough, mouth blister.
Sublingual Oralair (5-grass pollen extract)	-	Mild mouth/eye/ear/throat itching, sore throat, cough, mouth blister.
Sublingual Ragwitek (short ragweed pollen extract)	-	Mild mouth/eye/ear/throat itching, sore throat, cough, mouth blister.
Subcutaneous allergen extracts: weed pollens, dust mites	-	Redness or swelling or tenderness at the site of injection.

Antihistamines

All patients with allergic rhinitis should start taking second-generation oral antihistamines, such as desloratadine (Aerius), fexofenadine (Allegra), loratadine (Claritin), and cetirizine (Reactine).

Bilastine (Blexten) and rupatadine (Rupall), two brand-new second-generation antihistamines, have recently been made available in Canada.

Intranasal corticosteroids

Intranasal Corticosteroids are also first-line therapy choices for people with mild chronic or moderate/severe symptoms, and they can be taken either alone or in conjunction with oral antihistamines. Intranasal corticosteroids efficiently reduce nasal mucosal inflammation when taken consistently and correctly, and they also improve mucosal pathology. In individuals with concomitant allergic rhinitis and asthma, they have also been proven to lessen lower airway symptoms and improve ocular symptoms.[17-19]

Nasal irritation and stinging are the most frequent adverse effects of intranasal corticosteroids. Aiming the spray just a little bit away from the nasal septum will typically prevent these negative effects.

Combination intranasal corticosteroid and antihistaminenasal spray

A combined corticosteroid/antihistamine spray can be used if intranasal corticosteroids are ineffective. The drug Dymista has the combination of fluticasone propionate and azelastine hydrochloride. With a safety profile resembling that of intranasal corticosteroids, this method has been found to be more efficient [20-23]

Leukotriene receptor antagonists (LTRAs)

While beneficial in treating allergic rhinitis, the LTRAs montelukast and zafirlukast do not seem to be as efficacious.[24-26] LTRAs and antihistamines have been proven to be as effective as intranasal corticosteroids in one short-term research, though.[27] Intranasal corticosteroids are more effective than the combination for decreasing nasal and nocturnal symptoms, according to longer-term trials. [14,28]

Oral and intranasal decongestants

These are helpful for persons with allergic rhinitis to relieve nasal congestion. Oral

decongestants' side-effect profile, which includes agitation, sleeplessness, headaches, and palpitations, may prevent long-term use. Additionally, patients with significant coronary artery disease and uncontrolled hypertension should not use these medications. Intranasal decongestants shouldn't be taken for longer than 3-5 days because doing so increases the chance of developing rhinitis medicamentosa (rebound nasal congestion)

Immunotherapy

In immunotherapy, the patient's relevant allergens are subcutaneously administered in progressively larger doses. In particular, patients with seasonal rhinitis respond well to allergen immunotherapy. Immunotherapy should only be used on patients for whom the best avoidance strategies and medications are ineffective at controlling symptoms or are poorly tolerated.

Patients who are undergoing sublingual immunotherapy are desensitized by holding an allergen extract tablet under their tongue until it dissolves. Grass and ragweed allergies, together with allergic rhinitis brought on by house dust mites (with or without conjunctivitis), can all be treated with it at the moment. Immunotherapy administered sublingually instead of subcutaneously has a number of potential advantages. After the first week of therapy, these symptoms usually go away. This method of immunotherapy carries a very low risk of more serious systemic allergic responses.

Economic burden of Allergic rhinitis

About 50 to 60 percent of all cases of rhinitis are allergic. In the United States, between 30 and 60 million people suffer from allergic rhinitis each year, with 10% to 30% of adults and up to 40% of children being affected.

**Table 3: Structural health care plan barriers to care and associated economic impact in allergic rhinitis(AR)
ER= emergency room; OTC= over the counter; HRQoL= health related quality of life**

Barrier	Impact on cost
Lack of health-care plan or limited coverage and access to health care	Increased direct and indirect costs due to serious complications resulting from untreated AR can lead to serious complications and increases direct and indirect costs
Lack of preventive services or focus	Increased direct costs and increased indirect costs due to more frequent and severe exacerbations of allergen- induced airway disease
Restrictions on referrals to specialists(e.g., allergists)	Decreased direct cost and increased indirect costs associated with reduced HRQoL and productivity due to complications
Limits on prescription refills	Increased costs for ER and office visits to obtain medication on emergency basis
Multitiered drugs copay schedule	Potentially increased severity direct costs attributable to increased severity resulting from use of OTC or home remedies

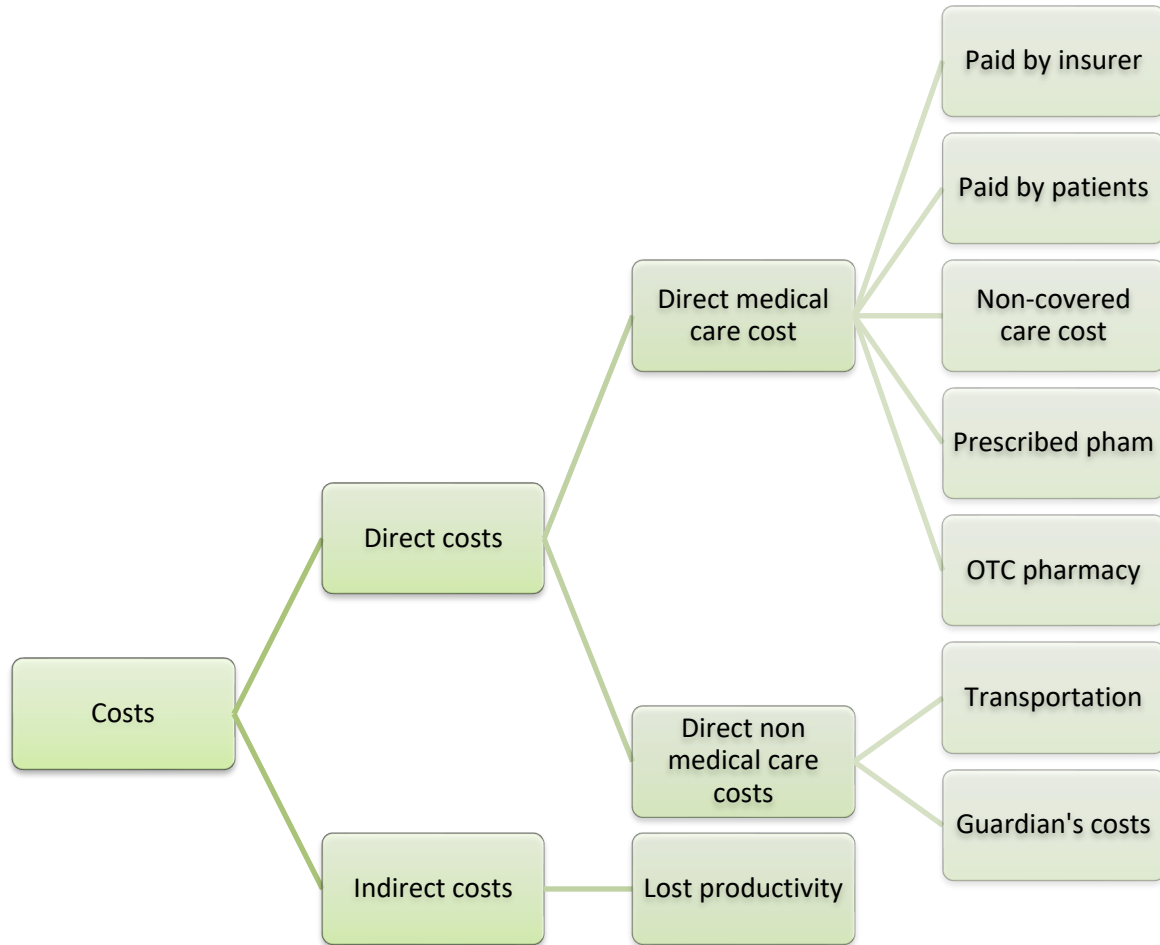


Figure 4: Classification of direct and indirect cost

- **Medical care costs:** This cost generally include the NHIC payments, covered care costs and other costs such as hospital food costs as well as the cost of prescribed medications for pharmacies.
- **Non-medical care costs:** It includes guardian costs as well as transportation costs for visiting hospitals. A lost production as a result of attending the hospital was considered an indirect cost.

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