

ĀYURVEDIC APPROACH TO DOWN SYNDROME



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OM DHANVANTARAYE NAMAHA



॥ *dhanvantaristotram* ॥

ॐ शंखं चक्रं जलौकां दधदमृतघटं चारुदोभिश्चतुर्भिः ।
सूक्ष्मस्वच्छतिहृद्यांशुक परिबिलसन्मौलिमंभोजनेत्रम् ॥
कालाम्भोदोज्ज्वलांगं कटितटविलसद्धारुपीतांबराढ्यम् ।
वन्दे धन्वंतरिं तं निखिलगदवनप्रौढदाघाग्निश्लिलम् ॥

om śaṅkhaṃ cakram jalaukāṃ dadha-
damṛtaghaṭaṃ cārudorbhiścaturbhiḥ
sūkṣmasvacchātihṛdyāṃśuka parivilasa-
nmaulimaṃbhojanetram |
kālāmbhodojjvalāṅgaṃ kaṭitaṭavilasa-
ccārupītāṃbarāḍhyam
vande dhanvantariṃ taṃ nikhilagadavana-
prauḍhadāvāgnīlīlam ॥

Salutations to HIM, Lord Dhanvantari, who is holding in HIS four hands a Sankh,
a Disc, a Leech and a pot of celestial ambrosia
in whose heart shines a very clear, gentle and pleasing blaze of light,
which also shines around HIS head and lotus eyes.
On the dark blue/black water HIS body is luminous and splendid.
HIS waist and thighs are covered in yellow cloth
and WHO by HIS mere play destroys all diseases like a huge forest fire.

DEDICATION

I would like to dedicate this paper to my nephew, Aravind, who inspired me to research this topic.

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ABSTRACT

Down syndrome is a genetic disorder caused by the presence of extra genetic material from chromosome #21 in some or all of an individual's cells. The condition reduces cognitive ability and results in certain characteristic physical features. In addition, individuals with Down syndrome may have considerable abnormalities in other body systems putting them at greater risk for heart defects, vision problems, gastrointestinal problems, ear infections, breathing difficulties, memory loss, and thyroid dysfunctions. Approximately 1 in 800 to 1,000 children are born with Down syndrome. The occurrence of Down syndrome is affected by the age of the mother and other factors.¹

CHROMOSOMES AND CELLS

Deoxyribonucleic acid, or DNA, is contained in the nucleus of each cell and encodes the genetic information inherited from an individual's parents. During the majority of the cell cycle, DNA is present in cells as chromatin, which appears as a tangled mix of DNA and proteins. However, during processes of cell division (mitosis and meiosis), DNA condenses into distinct chromosomes. Each chromosome consists of a singular piece of DNA carefully folded with the help of proteins.

Human cells usually have 46 chromosomes—22 pairs of homologous chromosomes and a pair of 'sex' chromosomes. The members of a pair have the same genes in the same locations, but they may have different variations of the genes. During the process of meiosis which occurs in the ovaries and the testes, these cells are supposed to split into sperm and egg cells with 23 chromosomes each. These gametes should contain one chromosome from each of the 23 pairs.²

Cells are the basic functional unit of living organisms. Cells work together to form tissues, which combine to form organs. These organs work together in systems which, in turn coordinate to form the human body. Therefore, cellular function affects the entire hierarchy. It follows that additions, deletions, or mistakes in DNA which affect cellular activity, can in turn cause problems on the organismal level. In the case of Down Syndrome, the presence of extra genetic information is the cause for the observed symptoms.

TYPES OF DOWN SYNDROME

There are three genetic abnormalities that can cause Down Syndrome. The most common form (92-95% of cases), known as Trisomy 21, is characterized by an extra copy of chromosome 21 in all cells in an individual's body (figure 1).^{1,2} Individuals who

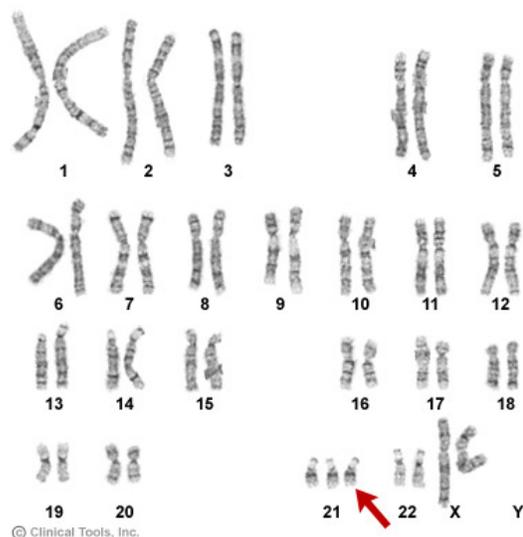


Figure 1. Chromosomes present in each cell of a female with Trisomy 21. The extra chromosome is indicated.

have an extra copy of chromosome 21 in some, but not all, of their cells and who have a partial triplication of chromosome 21 also experience the symptoms of Down syndrome.¹

SIGNS AND SYMPTOMS

The chromosomal abnormalities associated with Down syndrome manifest in a variety of physical and medical symptoms. Symptoms of Down syndrome can range from mild to severe and all patients with this condition do not exhibit all of the symptoms described below. Suspicions about this condition are usually raised at birth when babies display characteristic physical features such as a flat appearing face, upward slanting eyes, short neck, abnormally shaped ears, floppy muscles, small mouth making the tongue protrude, deep crease across the center of the palm (simian crease), white spot in the center of the iris, wide space in between the first two toes, small hands and feet, and extra folds of skin near the eyes.^{3,4}

In addition to characteristic appearance, babies and children with Down syndrome develop more slowly than normal. They experience delays in speech, crawling, and walking as a result of their mental retardation and floppy muscles (hypotonia). Mental retardation resulting from Down syndrome is often considered mild-to-moderate and IQ is usually in the “trainable range.” Therefore, most Down syndrome patients can be trained to care for themselves, follow social behavioral norms, and even hold simple jobs.³

A variety of medical conditions often accompany Down syndrome. Heart defects such as holes in the walls of the heart’s chambers affect 30 to 50 percent of Down syndrome patients.³ Gastrointestinal problems resulting from impaired nutritional absorption or obstructions of the esophagus or intestines affect 5 to 7 percent of those with Down syndrome. Individuals affected with Down syndrome also experience increased susceptibility to infections, hearing loss, obesity, vision impairments, cataracts, respiratory problems, kidney disorders, leukemia, skeletal problems, and thyroid disease. As they age, individuals with Down syndrome are increasingly susceptible to dementia, Alzheimer’s, thyroid problems, diabetes, and seizure disorders.^{3,4} In particular, the risk for Alzheimer’s increases four-fold for those with Down syndrome. Researchers have shown that even Down syndrome patients who do not demonstrate the symptoms of Alzheimer’s have the same cellular and structural changes occurring in their brains as those with Alzheimer’s.³

ETIOLOGY

Trisomy 21, the triplication of chromosome 21, is caused by genetic abnormalities in the sperm or, more commonly, the egg that come together to make the embryo. Improper sperm and egg cells result when the 21st pair of chromosomes fails to separate during their formation.^{1,2} Studies have shown that increasing age of the parents, particularly the mother, makes it

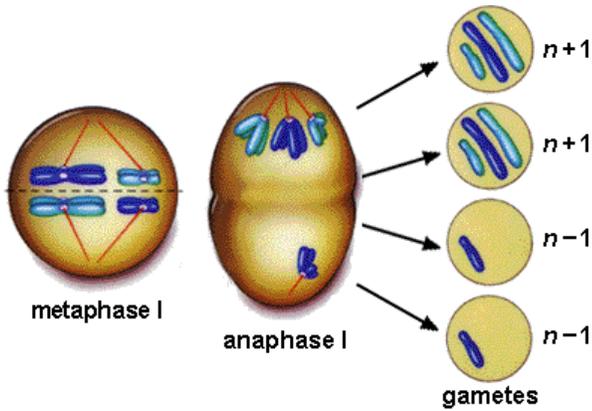


Figure 2. Simplified schematic of improper chromosome separation.

more likely that their egg and sperm cells do not have the correct number of chromosomes and may contribute to Down syndrome in their child.⁵

Another type of Down syndrome can result when an error in cell division early in embryonic development yields a mixture of normal cells and trisomy 21 cells. Down syndrome can also result when a piece of extra material from chromosome 21 attaches to or replaces a part of another chromosome, most commonly

chromosome 14. The triplicated portion of chromosome 21 may be passed on from a parent who carries it without significant symptoms, but most commonly results from random genetic mutations.^{1,2}

TREATMENT

There are no specific medications or therapies to directly treat Down syndrome. Once the condition has been confirmed with a karyotype test, an individual with Down syndrome must get regular medical check-ups to monitor other medical conditions that are associated with the disorder. Therapies are targeted towards treating and correcting these conditions rather than treating the disease as a whole (medications for heart conditions, surgery for cataracts/bowel obstructions, speech therapy for problems with speech development, psychiatric therapy for depression, medications for hypothyroids, antibiotics for ear infections, etc). Long-term therapy involves training for personal hygiene and normal communication, dietary planning to prevent further medical complications, and exercise to improve muscle tone.⁵

Controversial therapies that have not yet been verified for efficacy or approved include the use of nutritional supplements such as antioxidants and cell therapy (where freeze-dried cells from an animal are injected into the body to improve the physical features of those with Down syndrome). Piracetam, a medication that some claim improves memory and learning ability, has been shown to be ineffective in enhancing learning and development in Down syndrome children.⁵

PREVENTION

Once a baby is conceived with Down syndrome, there is no way to prevent this disorder. However, prenatal indicators and testing can be used to determine whether or not the child has Down syndrome. If a fetus is found to have Down syndrome, the parents can choose to either abort the child or to find the resources (such as support groups, information about caring for Down syndrome patients, and a willing doctor) to help them support a child with Down syndrome.⁵ Before birth, Down syndrome is suspect when there are certain abnormalities in a pregnant mother's circulating blood (such as low levels of

alpha-fetoprotein) or when an ultrasound exam reveals that the infant's neck is unusually thick. These prenatal factors are only somewhat accurate, so they are often followed by more definitive tests including the examination of the fluid in which the baby is floating (amniocentesis) or tissue from the placenta (chorionic villus sampling).³ A cheap, safe, and accurate prenatal technique that is currently under study involves sequencing DNA fragments (from fetal DNA) in the mother's blood and looking for higher than normal levels of fragments from chromosome 21.⁶

ĀYURVEDIC INTERPRETATION OF THE MIND

The mind is made up of subtle aspects of the five elements. Like space, the mind is expansive and all-pervasive. The mind quickly jumps between thoughts resembling the quick movement of air. The fire in the mind allows it to perceive external light in various forms. The emotion, empathy, and feeling of the mind give it a watery quality. The earthen quality of the mind is the weight of its attachments and memories. In its attributes and qualities, the mind encompasses all five of the elements.⁷

The five elements are the building blocks of the three *doshas*: *vāta*, *pitta*, and *kapha*. These three *doshas* are the forces that govern the functions of the body and the mind. In the mind, *vāta dosha* is responsible for the retrieval of thoughts and information.⁸ The five *subdoshas* of *vāta*, *prāna*, *samāna*, *vyāna*, *udāna*, and *apāna*, govern all of the individual functions of *vāta* in the body and are responsible for the symptoms associated with *vāta* vitiation. Mental movement, thought and emotion are affected by all of the *subdoshas* of *vāta*. *Prāna vāyu* resides in the mind and moves downward into the chest. Disturbances of *prāna* cause disturbances in the mind and the respiratory system. When *prāna vāyu* is disturbed in the mind, it creates fear, anxiety, worry, and nervousness. In the mind, *samāna vāyu* balances and stabilizes the other *vāyus*. It is also responsible for absorbing sensory impressions into the workings of the brain and the mind. When it is disturbed, a person loses control of his thoughts and feelings. In the mind, *vyāna vāyu* is responsible for the movement of thought. When disturbed, *vyāna vāyu* causes thoughts to move without control resulting in obsessive thoughts, overwhelming feelings and neurological problems leading to tremors. The role of *udāna vāyu* in the mind is bringing stored information into our awareness or memory. It is also responsible for all cellular action as well as mental and emotional expression. It plays the role of propelling speech. *Udāna vāyu* vitiation includes faulty expression, as occurs in speech impediments such as stuttering and stammering, and difficulty with memory. *Apāna vāyu* is responsible for elimination of waste. Vitiation of *apāna* leads to faulty elimination in the form of negativity in mind.

“The corporeal (pertaining to the body) vāta [which consists of prāna, udāna, samāna, apāna, and vyāna] when aggravated, affects the body with various types of diseases and affects the strength, complexion, happiness and life span. It perturbs the mind, affects the sense faculties, destroys, deforms, and detains the embryo for long. It give rise to fear, anxiety, bewilderment, humility and delirium.” [Charaka Samhitā]

The other two doshas also play important roles in the mind. “*Pitta* is responsible for metabolizing ideas and information. *Kapha dosha* protects the mind against the movements and agitation generated by the *vata* and the heat and intensity generated by the *pitta*.”⁸ When functioning normally, *avalambaka kapha*, a *subdosha* of *kapha*, hydrates the mucous membranes of the lungs and bronchial tissue and protects against infections, allergies, and general weakness. When it is vitiated, there is mucous accumulation in the respiratory system, weight gain, stubbornness, and clinging. *Tarpaka kapha* helps the nerve impulses move at the proper rate by nourishing and protecting the axons of the nerves. *Tarpaka kapha* is the Western equivalent of cerebrospinal fluid—it protects the brain from excessive *vata* and *pitta* imbalances. When vitiated, it obstructs nerve impulses causing them to move slower than normal, resulting in slow response times, mental dullness, physical dullness, and complacency.⁹

The energies controlling the function of the subtle body are the energetic templates of *vāta*, *pitta*, *kapha* and are called *prāna*, *tejas*, and *ojas*.¹⁰ Genetic diseases cause a lack of clarity (*sattva*) within the mind due to *karmic* consequences. This results in imbalances of *rajas* and *tamas*, which cause disturbances in *prāna*, *tejas*, and *ojas*. This ultimately affects the physical body by causing imbalances in *vāta*, *pitta*, and *kapha*.¹¹

THE FIVE LAYERS OF HUMAN EXISTENCE (*KOSHAS*)

The inner Self (*Purusha*) is covered in five sheaths: The Food Sheath (*Annamaya Kosha*), The Breath Sheath (*Prānamaya Kosha*), The Mental Sheath (*Manomaya Kosha*), The Intelligence Sheath (*Vijnamaya Kosha*), The Bliss Sheath (*Ānandamaya Kosha*). “The Food Sheath makes up the physical body; the Mental Sheath the astral body; and the Bliss Sheath the causal body. The Breath Sheath mediates between the physical and astral bodies; the Intelligence Sheath mediates between the astral and causal bodies.”¹²

“Prāna is the life force energy drawn by prāna vāyu into the body. It circulates through the body and mind as the four remaining vāyus and when it becomes disturbed, creates the vāta dosha responsible for disease.”

[Dr. Marc Halpern, *Principles of Āyurveda*, Vol 1, p.81]

These bodies are connected by channels (*nādīs*), which allow energy or *Prana* to flow between them. The energy that flows through these channels contributes to health; therefore, understanding the energy flow is important for diagnosing disease. The *chitta nādī* is the principal channel connecting the *annamaya*, *manomaya*, and *ānandamaya koshas*. It passes information from the *manomaya* and *ānadamaya koshas* (dreams and subconscious mind) to the *annamaya kosha*, where it manifests in the cellular memory as genetic (*karmic*) disease.¹²

ĀYURVEDIC INTERPRETATION OF KARMA

Karma determines the fundamental attributes of an individual's personality. These characteristics, known as *samskāras*, determine each individual's characteristic reaction to particular situations. Since they are etched in the subconscious (*citta*) of an individual, they are extremely difficult to override. These tendencies create challenges that need to be overcome. Facing these challenges allows an individual to learn lessons that help in exhausting the karmic consequences of past lives. However, selfish actions in the current life create new karma, which takes over and manifests itself as disease.¹³

CLASSICAL ĀYURVEDIC INTERPRETATION OF DOWN SYNDROME

Classical Āyurvedic texts do not directly address Down syndrome and many other mental disorders. These conditions may have been dismissed in earlier times as a form of insanity (*unmada*) or possession by evil spirits (*bhutonmada*).

Down syndrome falls in the *ādhyātmika* branch of diseases which includes conditions with "a spiritual cause, those coming from a past life."¹⁴ In his textbook of Āyurveda, Dr. Lad explains that "Ādhyātmika disorders primarily affect *buddhi* (intellect), *smṛuti* (memory) and *dhruti* (learning capacity and attention). They can be so serious that they affect both the functioning and structure of the brain and sense organs...Ādhyātmika diseases include many genetic and congenital disorders."¹⁴ More specifically, *ānuvamshika roga* refers exclusively to genetic diseases. The term *ānuvamshika* (genetic) comes from *ānu* (resulting from) and *vamsha* (family/lineage).

Genetic disorders, such as Down syndrome, can also be categorized as *Ādhi Bala Pravrutta* indicating that they occur before conception.^{14,15} This category includes subdivisions that indicate whether the disorder comes from the egg cell produced by the mother (*matrija*) or from the father's sperm cell (*pitrija*).¹⁵ While the improper number of chromosomes in the fertilized egg can result from contributions of either the mother or the father, it most commonly results from an improper egg. Therefore, Down syndrome is primarily classified as a *matrija* disease.

NIDHANA (CAUSES)

According to the classical text *Charaka Samhitā*, the cause of genetic diseases such as Down syndrome is *karmaja*. This indicates that these diseases are the manifestations of *sanchitta karma* accumulated from past lives. In the *Charaka Samhitā*, it states the following about *karmaja* (actions of past life) diseases: "The action performed in the previous life which is known as *daiva* (fate) also constitutes in due course causative factors for the manifestation of diseases. There is no major action (performed in the previous life) which does not lead to the corresponding results" [sutras 116-117].¹⁶ Dr. Lad narrows down the cause from *karmaja* to *ātmaja* by considering the subtle causes that affect the individual consciousness (*jeevātman*) as a result of an individual's *sanchita karma*.¹⁷ He explains that "the post-digestive effect of undigested past

karma is to create *samskāras* (impressions or tendencies) and these create a scar, called a *khāvaigunya* (weak space in the body). This causes the person to suffer.”¹⁷ In the case of Down syndrome, patients usually have a weak head, known as *manasmandyam*; this is the term used for mental retardation by both *Charaka* and *Sushruta*.

“It is a fact, that in individuals having the association of past action, the physique and the mind are respectively derived from the physique and mind of his past life. The dissimilarity in the shape and intellectual faculties is caused by the rajās, tamās, and the nature of the past actions.”
[*Charaka Samhitā*, sutra 36]

“This association or combination of the subtle body with the sperm and ovum is conditioned by the [unrighteous, selfish] actions in the past life. The cause and effect always bear resemblance with each other...Dominance of rajās and tamās, and the actions in the past life are responsible for the variations in the characteristic features of individuals.”
[*Charaka Samhitā*, sutras 31-36, Commentary by Bhagwan Dash]

RŪPA (SYMPTOMS)

In Down syndrome, the predominant symptoms are seen in the mind in the form of *manasmandyam* (mental retardation). Down syndrome patients often also demonstrate memory loss (Alzheimer’s) later in life and speech impairments. Many also show fear, worry, and anxiety. A non-painful accumulation of fluid in the middle ear, known as glue ear, is common in Down syndrome children and can contribute to their slow speech development.¹⁸ Some Down syndrome patients also have difficulty breathing as a result of low muscle tone/muscle weakness. Additionally, many children with Down syndrome have congenital heart defects; the most common of these is an atrioventricular septal defect. Some Down syndrome patients also have gastrointestinal problems such as malabsorption and Gastro-oesophageal reflux. Other symptoms such as hypothyroid, obesity/weight gain, and cataracts are also common.²

“If *vāta* get increased in the *indriyas* (sense organs), it produces loss of function in the sense organs”
[*Mādhava Nidhānam*, sutra 15]
“*Vāta* produces *Jihwāstambha* (loss of movement of tongue) affecting the tendons/nerves near the voice box and causes inability for chewing, *sinking* and talking.”
[*Mādhava Nidhānam*, sutra 52]
“*Vāta* getting increased along with *kapha* invades the *dhamaniis* (vessels) of the voice box and makes the person ineffective in talking or talk through his nose (nasal speech) or cause stammering.”
[*Mādhava Nidhānam*, sutra 65]

SAMPRĀPTI (PATHOGENESIS)

Vāta Samprapti

Vāta accumulates in the *purushavaha srotas*, overflows into the *rasa* and *rakta dhātus*. As a result of low digestive *agni*, *samāna vāyu* relocates to the *annavaha srotas* and causes malabsorption. In the case of gastro-oesophageal reflux, the obstruction of the downward flow of *apāna vāyu* causes the *vāta dosha* to move upward and bring the *pitta* contents of the stomach into the esophagus. The downward flow of *vāta* can be caused by *apāna vāyu* in the *rasa dhātu* of the *purushavaha srotas* drying out the large intestine. *Vyāna vāyu* relocates deeper into the *raktavaha srotas* where it affects the vascular

tissue formed as an *upadhātu* of the *rakta dhātu*. *Udāna vāyu* then relocates into the *māmsa dhātu* resulting in systemic muscle weakness and speech impairment. It relocates to the *prānavaha srotas*, resulting in weakness of the muscles of respiration. *Prāna, samana and vyāna vāyu* also relocate to the *majja dhātu* and the *manovaha srotas*, resulting in inability to learn and memory loss. In the *manovaha srotas*, it results in anxiety and fear. The roles of the *majjavaha srotas* (brain) and the *manovaha srotas* (thought and emotion) are difficult to separate in this condition. The pre-existing genetic condition is exacerbated by *vāta* provoking factors (cold, light and dry diet, and a lack of routine).

Stage	Evidence	Dosha	Subdosha	Dhātu	Srotas	Herb Category	Examples
RMD	Malabsorption	Vāta	Samāna	N/A	Annavaha	Dipānas	Ginger, Clove, Pepper
RMD	Gastro-oesophageal reflux	Vāta	Apāna Udāna	Rasa Rasa	Purishavaha Annavaha	Laxatives	Triphala, cascara sagrada
RMD	Atrioventricular Septal Defect	Vāta	Vyāna	Rakta	Raktavaha	Circulatory Stimulants Heart Tonics	Hawthorn berries, ginkgo, cinnamon Bāla, hawthorn berries, arjuna
RMD	Muscle Weakness	Vāta	Udāna	Māmsa	Māmsavaha	Muscular Tonics	Ashwagandha, bāla
RMD	Speech impairment	Vāta	Udāna	Māmsa	Māmsavaha	Muscular Tonics	Ashwagandha, bāla
RMD	Difficulty Breathing	Vāta	Udāna	Māmsa	Pranavaha	Muscular tonics	Ashwagandha, bāla
RMD	Mental Retardation/ difficulty in learning	Vāta	Samāna, Vyāna	Majja	Manovaha	Nervine Tonics	Ashwagandha, bāla, guduchi, kappikacchu
RMD	Fear, worry, anxiety	Vāta	Prāna/ Vyāna/ Samāna	N/A	Manovaha	Nervine Sedatives Nervine Tonics	Ashwagandha, jatamansi, shank pushpin Ashwagandha, gotu kola, bāla, kapikachhu, guduchi
RMD	Memory loss (Alzheimer's as patients age)	Vāta	Udāna	N/A	Manovaha	Channel Clearing Nervine Tonics	Basil, brahmi, calamus Ashwagandha, bāla, guduchi, kappikacchu
RMD	Cataract	Vāta	Vyāna	Majja	Majjavaha	Eye Tonics	Chyavanprash, Bhringaraj, Brahmi Triphala Water, Yashtimadhu

Kapha Samprāpti

In Down syndrome, the *vāta* imbalance pushes *kapha* out of balance causing several *kapha* symptoms. Gastro-oesophageal reflux can be caused by the relocation of *kapha* into the large intestine which results in blocking *apāna vāyu*. *Kapha* accumulates in the *annavaha srotas*, overflows into the *rasa* and *rakta dhātus* and relocates into the thyroid gland. The thyroid gland is a part of the *rasavaha srotas* because it is mainly hypervascular epithelial tissue. Secondary symptoms arise and *kapha* relocates into additional *srotas* and tissues. *Kapha* then relocates into the *prānavaha srotas*, where mucus builds up. This leads to the vitiation of the *avalambaka kapha*, which causes the painless buildup of sticky fluid in the middle ear, known as glue ear. *Kapha* also relocates into the *medas dhātu*, causing obesity.

Stage	Evidence	Dosha	Subdosha	Dhatu	Srotas	Herb Category	Examples
RMD	Gastro-oesophageal reflux	Kapha	N/A	Rasa	Purishavaha	Purgatives	Senna, dried aloe, cascara sagrada
RMD	Hypothyroid (low <i>ojas</i> / low immunity)	Kapha	Avalambaka	Rasa	Rasavaha	Thyroid stimulants	Maca, Kelp, Bladderwrack
RMD	Glue Ear	Kapha	Avalambaka	Rasa	Prānavaha	Decongestants Astringents	Bishop's Weed, Vachā Sage, Tulsi, Neem
RMD	Obesity/ weight gain	Kapha	Avalambaka	Medas	Medovaha	Lekhanas	Guggul, kutuki, chitrak
RMD	Mental Dullness	Kapha	Tarpaka	N/A	Manovaha	Nervine stimulants	Brahmi,

CHIKITSĀ (TREATMENT)

Since Down syndrome is genetic in origin, there is no known cure. While the root cause of the disease cannot be treated, there are several therapies that can be used to treat the various symptoms that are associated with Down syndrome. Since the actual combinations of symptoms vary greatly between individuals, this section will primarily discuss treatments for the most common symptoms—those involving cognitive ability and memory. Since *vāta* vitiation is the primary cause of Down syndrome the treatment protocol should be strengthening and building to increase the *prāna* (life energy) present.¹⁹

Mental retardation, the most universal symptom associated with Down syndrome, can be treated using Āyurvedic drugs which have *medhya* properties. The term '*medha*' refers to various components of intellect; *medhya* drugs can be used to enhance various mental functions. Recent studies have been conducted in order to establish the ability of these drugs to help in treating many mental problems including mental retardation and learning disabilities. These studies have shown that compounds such as *Ashtamangala Ghrita* and *Ashtanga Ghrita* as well as combinations of herbs such as *Mandukaparni*, *Yasthimadhu*, *Guduchi*, *Shakhapushpi*, and *Jyotishmati* are effective in treating children with mild mental retardation.

Ayurvedic formulations including herbs such as *Guduchi* (*Tinospora cordifolia*), *Kushtha* (*Saussarea lappa*), *Abhaya* (*Terminalia chebula*), and *Shankhpushpi* (*Convolvulus pluricaulis*) are effective in helping children with learning disabilities.²⁰

“Acharya Charaka (2000BC) with his intellectual genius describes the process of acquisition of knowledge and change in behavior accordingly, in a compact form, which on elaboration opens, the possibilities of the intellect. Indriyas (cognitive and motor organs) along with the manas (mind) perceive the indriyarthas (sense objects). Buddhi is one of the three internal causative factors of knowledge. Dhi, Dhriti, and Smriti are three functional units of Buddhi. Medha is the synonym for buddhi. Dhi is faculty of higher order cognition which is responsible for processing of perceived information. Dhriti can be interpreted as retention power. Smriti is subject’s ability to recall the objects that are perceived.
[Dr. Abhimayu Kumar, “Ayurveda for Child Mental Health”]

Herbs

Brahmi can improve mental functions by modulating neurotransmission via acetyl choline and gamma-aminobutyric acid (GABA). By restoring the function of neural receptors, *Brahmi* increases memory span, decreases anxiety, helps correct speech defects, and improves concentration. Many studies have shown that *Brahmi* enhances protein activity and synthesis, especially in the brain, thereby increasing intelligence, longevity and memory. In addition to enhancing cognition, *Brahmi* also has antioxidant properties, increases *ojas*, and serves as a muscle relaxant, an anti-convulsant, a blood purifier, a stress reliever, an anti-pyretic, carminative and digestive agent.²¹

Brahmi tastes bitter and astringent and is slightly hot in effect. It pacifies all three doshas, particularly *vāta* and *kapha* which are primarily involved in Down syndrome. Āyurvedic physicians believe that *Brahmi* is the most effective drug in treating the factor that governs the nervous system—*vāta* vitiation.²¹

Vaidya Rama Kant Mishra has demonstrated that high levels of mercury in the brain and slow speech development in a 2-year-old Down Syndrome child can be treated with spinal treatments using *Brahmi* Transdermal. Within two months, the child who was undergoing treatment started speaking in full sentences and had no mercury in his brain. With continued therapy, the child’s health and development have continued to improve.²²

The roots of the ***Ashwagandha*** shrub can also be used to improve health by increasing mental activity and invigorating the body in addition to many other things. Researchers at Banaras Hindu University have found that many elements of *Ashwagandha* are antioxidants. This property contributes to *Ashwagandha*’s ability to facilitate cognition, reduce inflammation, increase *ojas* and resist aging. Scholars at the University of Leipzig have found that *Ashwagandha* increases acetylcholine receptor activity in the brain. Increased neurotransmitter activity explains the observed increases in cognitive ability and memory in patients treated with *Ashwagandha*. *Ashwagandha* extracts also resemble the neurotransmitter

gamma-aminobutyric acid (GABA), which helps these extracts reduce anxiety. Researchers have found that *Ashwagandha* enhances memory and increases the growth of the axons and dendrites of neurons.²³

Nervous System Treatment and Enhancement

Treatment for Dysfunction and Depletion: Take 3 unpeeled almonds, one black pepper, and one teaspoon fennel seeds. Soak overnight in water and blend with sweet butter and honey. For 15 days, eat first thing in the morning 1½ hours before eating anything else.¹⁹

Rejuvenation and Detoxification: Twice a day, take 1 teaspoon of *Brahmi*, *Gaduchi*, and *Ashwagandha* (mixed together in equal quantities) with hot water, ghee and honey.¹⁹

Strengthening and Calming: Take ½ teaspoon of a combination of *Jatamansi*, *Shankpushpi* and *Brahmi* mixed in equal proportions. *Vācha* (*Acorus calamus*) can also be added if it is compatible with the patient.¹⁹

Meditation

Meditation will accustom the mind to being calm and increase its sharpness. This will help in relieving fear, worry, and anxiety in addition to improving learning capacity. Meditation clears the mind and increases *prāna* (energy).

“Meditation promotes secretion of *tarpak* wherein it becomes *Soma* or *Amrit*, the nectar of immortality.”

[Dr. David Frawley]

Prānayama

All *prānayama* techniques move *prāna* or energy, thereby increasing the availability of *prāna* for bodily functions. For Down syndrome, alternate nostril breathing (*anulom vilom*) is recommended. In this practice, the breath alternates between nostrils on inhalation and exhalation. It has a balancing effect on the flow of *prāna* through both *nādīs* (*ida* and *pingala*), thus equally increasing the qualities of fire and water. As a result of the balanced flow through both of these *nādīs*, *prāna* is drawn into the *sushma nādī* and the quality of ether increases as well. This practice equally increases *prāna* and *tejas* and is neutral to *ojas*.

Panchakarma

Panchakarma is a powerful therapy that rejuvenates and cleanses the body. In addition to detoxifying the cells in the body, it allows an individual to access his/her true consciousness. This allows the intellect to remember its true identity as a field of love and consciousness, thereby allowing the body to heal.¹⁹

Abhyānga, Shirodhāra, and Swedhna—Bliss Therapy

Therapies such as *abhyānga*, *shirodhāra*, and *swedhna* are deeply relaxing, calming the mind and allowing the disturbances to subside. When these therapies repeated daily are combined with the purity of the Āyurvedic diet, all obstruction is removed between the patient's individual awareness and universal consciousness. The oil therapy of *shirodhāra* strengthens the mind, building *ojas* to contain the *prāna* and *tejas*. The combination of *abhyānga*, *shirodhāra*, and *swedhna* is known as bliss therapy.²⁴

The treatment begins with 40 minutes of oil massage called *abhyānga*. This is followed by a 20-minute herbal steam using *dashamoola* (a mixture of 10 root extracts). *Shirodhāra* follows; during this step, body-temperature oil is poured in a gentle continuous fashion over the 6th chakra (in the forehead) for 20 minutes. *Shirodhāra* is used in general tonification of the nervous system in order to correct *doshic* imbalances, particularly in the case of *vāta* mental and emotional conditions. The entire process should be repeated for seven days.¹⁹

Basti

Anuvasana Basti is used for the treatment of several disorders including multiple sclerosis, muscular dystrophy, Alzheimer's, and dementia. *Hrud Basti* nourishes, strengthens, and regulates heart functions and can be used to combat the congenital heart problems common in Down syndrome children. A dough dam filled with medicated oil or ghee is placed over the heart.

Nāsya (with Brahmi Ghee)

Nāsya with *Brahmi* Ghee helps to clear the nasal passages and sinuses. *Nāsya* is the best form of medicine for diseases of the head because it has a direct action on the brain and *prāna*. It is beneficial for memory difficulty; it maximizes absorption of *prāna*.²⁵

“Massage the head and neck, then take a hot shower. Following this, steam the face and neck by using the following method: fill a large bowl with freshly boiled water. Add 1-2 drops eucalyptus oil or Vicks Vaporub. Take a clean, large towel and drape it over the head to make a tent. Lean over the bowl so that the steam is trapped inside the towel tent. Inhale the steam for two to three minutes. Gently apply hot towels to the neck and face. After steam inhalation follow instructions below to sniff Brahmi ghee.

Using an eye dropper, place two or three drops of Brahmi ghee (see recipe below) directly into both nostrils. Sniff the oil into the sinus cavity. Hold both nostrils closed, then breathe in through the nose while rapidly closing and opening the nostrils. Repeat the sniffing procedure three times.”

[Dr. John Douillard, “Attention Deficit Disorders: An Āyurvedic Perspective”]

Brahmi Ghee Recipe

“Boil 3 teaspoons of Brahmi (powder, leaves, or crushed tablets) in one cup of water for 5 minutes. Strain the liquid through a cotton cloth. Add a cup of ghee to the remaining liquid and boil this mixture until the water is evaporated (approximately 15 minutes). Take care that the brahmi-ghee doesn't burn once the water is evaporated.”

[Dr. John Douillard, “Attention Deficit Disorders: An Āyurvedic Perspective”]

Color Therapy

Āyurvedic medicine uses the energies inherent in the colors of the spectrum to restore balance. Each of the seven colors of the spectrum is associated with specific healing properties. Down syndrome patients can be treated with various colors that calm the nervous system, provide clarity, and promote communication and knowledge acquisition. Violet, indigo and green can be used to calm the nervous system. Yellow serves as a sensory stimulant, enhancing clarity and wisdom. Blue helps with communication and knowledge acquisition. Therapeutic color can be administered in number of ways. One way is to wrap the patients in colored cloth chosen for its therapeutic hue. Patients may also be bathed in light from a color-filtered light source to enhance the healing effects of the treatment. Another method of color therapy treatment recommended is to treat water with color and then drink the water for its ability to heal the symptoms. This is achieved by placing translucent colored paper or colored plastic wrap over and around a glass of water and placing the glass in direct sunlight so the water can soak up the healing properties and vibrations of the color.²⁶

Marma Therapy

Marma is a therapy that harnesses energy (*shakti*) through the application of pressure to sensitive energy points in the body. It clears blocked energy channels (*strotas*) and pacifies *vāta* and *vyāna vāta* in particular. Since Down syndrome is primarily caused by *vāta* vitiation, *marma* therapy offers a promising remedy. *Marma* affects patients on the physical, mental, emotional, and spiritual levels and allows them to transcend their perceived limits. Therefore, *marma* is ideal for treating a variety of conditions including memory loss, fear, anxiety, muscular strain, and respiratory conditions.²⁷

Dr. Pankaj Naram has found a successful *marma* therapy routine that benefits children with a variety of disorders including mental retardation as a result of Down syndrome. The treatment steps are as follows²⁷:

1. Press the tip of the child's index fingers 6 times in six sittings each day using thumb and index finger. Apply enough pressure to activate the subconscious mind, but remain gentle. Try to work both hands simultaneously.
2. Press the lower part of the ear lobes between the thumb and forefinger 6 times in six sittings each day.
3. Press the *marma* point at the base of the nose between the nostrils 6 times, 6 times a day.
4. Press the *marma* points at the top of the head with both hands. One hand should be on the back of the head and the other should be placed on the front of the head so that the tips of the fingers of both hands face each other. Press these points 6 times in six sittings each day.
5. Press the *marma* point in the middle of the forehead 6 times, 6 times a day using the thumb or index finger.

By activating the subconscious mind, this course of *marma* therapy permits deep reprogramming that helps patients connect better with the world around them. Thus, this therapy helps to improve quality of life in daily activities, speech capacity, communication skills, interpersonal interactions, and performance in school, family, and society.

G-Therapy

G-therapy or “homeo-biochemic formulation therapy” combines Āyurvedic herbs, homeopathic formulation techniques, and body salts. Since the 1970’s, Dr. Guntant Oswal has used G-therapy on over 1,700 children with various disorders such as ADHD, autism, learning disabilities, and Down syndrome. Out of the patients that he has treated, Dr. Oswal claims that none have experienced side effects and 70% have demonstrated improved speech and motor skills after 12 weeks of treatment. Dr. Oswal explains that “the body salts bring about the necessary changes in neuro-transmission, while the herbal extracts act as a catalyst.” He advocates using G-therapy in conjunction with other therapies in order to achieve optimum results.²⁸

RASAYANA (REJUVENATION) THERAPIES

Rasayana therapies are forms of tonification to build the *ojas* and the healthy *rasa* in the body. Some *Rasayana* therapies are performed with *Brahmi*-based mixtures.

Aromatherapy

Sāttvic aromatherapies using sandalwood or rose calm and clear the mind.

Mantra Therapy

Calming *mantras*, such as ‘*sham*’ and ‘*om*,’ facilitate the calming and clearing of the mind. *Mantra* therapy plays a particularly important role in pacifying the *udāna vāyu*.

Diet

Sāttvic diet increases mental *ojas* and helps with balancing the *doshas*. Cold, dry, light food that aggravates *vāta* should be avoided.

CONCLUSION

Down syndrome is predominantly a condition where *vāta* is vitiated and pushes *kapha* out of balance. Hence it is a dual *doshic* condition and lifestyle changes should be focused on pacifying the *vāta* and *kapha doshas*. Since Down syndrome is a karmic/genetic disease, it cannot be cured directly. However, the various steps discussed above can be used to alleviate

the effect of the multiple symptoms that are usually found in a patient with Down syndrome. The various therapies and herbs can increase the mental ability of a Down syndrome patient.

This *sloka* from the Bhagavad Gita goes to show that that one can be freed from *karma* and its effects by dedicating all actions to the supreme Self:

यत्करोषि यदश्नासि यज्जुहोषि ददासि यत् ।
यत्तपस्यसि कौन्तेय तत्कुरुष्व मदर्पणम् ॥ ९-२७ ॥
शुभाशुभफलैरेवं मोक्ष्यसे कर्मबन्धनैः ।
संन्यासयोगयुक्तात्मा विमुक्तो मामुपैष्यसि ॥ ९-२८ ॥

*yat karoṣi yad aśnāsi yaj juhoṣi dadāsi yat
yat tapasyasi kaunteya tat kuruṣva madarpaṇam 9.27*

*śubhāśubhaphalair evaṃ mokṣyase karmabandhanaiḥ
saṃnyāsayogayuktātmā vimukto mām upaiṣyasi 9.28*

*Consider all your acts as acts of devotion to me,
whether eating, offering, giving away, performing austerities.
Perform them as an offering to me. In this way you will be free from karma,
you will be liberated and you will come to me (9.27-28).*

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