

# The Relativity of Time in Dermatology

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*I never think of the future. It comes soon enough.*

Albert Einstein

Albert Einstein's theory of relativity changed our conception of time. Newtonian physics held that time is absolute and the same for everyone. Under Einstein's theory, time is relative, slowing down or speeding up based on one's frame of reference.

The relativity of time has its analogy in medicine with respect to the aging process. Most people age "normally". Some individuals, however, suffer from rare medical disorders in which they seem to remain ageless, as in syndrome X, or rapidly grow older as in progeria. The following patient histories illustrate these two seemingly opposite disorders of development and aging.

Syndrome X is a newly described disorder of unknown etiology in which children remain physically and cognitively similar to an infant or toddler despite increasing age (1). The first child reported with syndrome X was Brooke Greenberg (1993-2013) who was most endearing despite her many handicaps which included bilateral hip dislocations, dysmorphic features, abnormal brain development, and pulmonary complications, such as bronchomalacia, which caused her death.

At age 16, Brooke weighed just 17 pounds at 30 inches tall. In 2009, she still had her deciduous teeth, yet her hair and nails grew normally. Different organ systems appeared to develop at different rates. Her mental age was estimated to be 9-12 months while her bone age was like that of a 10 year-old. The skin of children with syndrome X has been described as "baby" like (2). No obvious genetic or chromosomal abnormality has been identified in syndrome X. Brooke was a miracle child who brought much love to her family. Brooke's story

and the extraordinary care she received from her family are poignantly portrayed in the documentary “Child Frozen in Time” (3).

The second case presentation is that of Sam Berns (1996-2014) who suffered from progeria, a disease he faced with courage and dignity. His clinical features were typical for the disease, including the alopecia and premature aging first described in 1886, by the English dermatologist Jonathan Hutchinson and later elaborated upon, in 1897, by the English surgeon Hastings Gilford (4). Other clinical findings in progeria include slowed growth, scleroderma-like skin, loss of body fat, narrow face, small lower jaw, beaked nose and head disproportionately large for the face. In progeria, cardiovascular disease and strokes usually cause death at an average age of 14 years old.

Sam, along with his parents Drs. Scott Berns and Leslie Gordon, helped raise public awareness about progeria in a 2013 documentary entitled “Life According to Sam” (5). His parents established the Progeria Research Foundation which in 2003 helped to discover the mutation in the LMNA gene responsible for the disorder. The Foundation also has been engaged in clinical drug trials using lonafarnib, the first medication to show clinical benefit in progeria (4).

Sam left us with a simple philosophy for a happy life (6):

- 1) Be OK with what you ultimately can't do, because there is so much you can do.
- 2) Surround yourself with people you want to be around.
- 3) Keep moving forward.
- 4) Never miss a party if you can help it.

Hopefully future research will find cures for syndrome X, progeria and all the other rare

disorders of premature aging such as Werner syndrome, Cockayne syndrome and xeroderma pigmentosum. This research may also give us a better understanding of the human aging process.

Albert Einstein changed our view of time, while medicine seeks to alter the deleterious effects of time upon the human body, thereby prolonging life and its quality. It is up to us, however, to use time wisely to better ourselves and the world.

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