



INFINITESIMAL CHANGE

Introduction to Insensible Losses by Daniel J. Bressler, MD, FACP

INTRODUCTION

It's difficult for the mind to grasp processes that occur at a very slow pace or on a very small scale. We use tricks like time-lapse photography to visualize the slow growth of a sprouting plant. We use abstruse equations to represent quantities far below the experiences of everyday life.

Mathematics has a term called the infinitesimal. It has a long and controversial history dating back to the ancient Greeks. In the 17th century the infinitesimal was crucial in the development of calculus. It is often characterized as the smallest imaginable quantity that is not zero. Although tiny, a series of infinitesimals can be summed up to produce real numbers. This process has proven to be extremely valuable in many applications in modern science.

In clinical medicine we have a term

called insensible losses, which carries some of the same meaning as infinitesimals. It refers to the slow, obligate loss of fluid, principally from the moisture in our breath and evaporation from our skin. This water volume is difficult to detect and measure yet plays a crucial role in fluid and electrolyte balance, particularly during long surgeries, in other patients who are not taking oral food or liquid, and in those with neurologic disorders who have lost the ability to sense or communicate hunger or thirst.

In this poem, *Insensible Losses*, I use the term to represent all the slow, near-negligible processes to which our biology binds us. Most of these processes are features of our evolutionary heritage. Our insensible losses identify us as part of the tree of life. And, along with all parts of that tree, these losses mark us as mortal. **SDP**

Dr. Bressler, SDCMS-CMA member since 1988, is chair of the Biomedical Ethics Committee at Scripps Mercy Hospital and a longtime contributing writer to San Diego Physician.



INSENSIBLE LOSSES

*Moment to moment
Hour to hour
Time disappears
Like dew from a flower
Where does the day go?
Our memory glosses
An evaporative loop
Of insensible losses*

*Gravity pulls
Energy launches
Life hesitates
Sitting back on its haunches
Breath follows breath
With organized pauses
Till the rhythm succumbs
To insensible losses*

*How did we get here?
By what cosmic charter?
Water and air
Serve biology's barter
To live is to breathe
We're bound by those clauses
Our existence is tied
To insensible losses*

*How does the mind
Emerge from this matter?
How do these thoughts
Stand out from such clatter?
Consciousness gushes
The brain's secret sauce, is
Yet doomed to run dry
From insensible losses*

*We study the blood
We research the heart
We vanquish the plagues
That once tore us apart
We intervene boldly
To know what the cause is
But must finally concede
To insensible losses*

*We come to remember
We come to place roses
We dab our red eyes
And blow our wet noses
We whisper our prayers
At gravestones and crosses
Where our someones lay stilled
From insensible losses.*