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"Until puberty the human
mind works like a camera.
After puberty it works
like a projector."

— Joon Yun

Healthcare is a Natural Hedge for Pension Funds

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A crisis looms over corporate, state, and federal pensions in the U.S. and Europe due to the growing difference between the growth of payout obligations to retirees and growth of assets held in those funds. The obligation to retirees is skyrocketing due to lengthening lifespan, and the number of workers contributing into such funds is declining due to below-replacement fertility rates.

The estimated present value of unfunded obligations is $1 trillion for U.S. state pensions[1] and at least $5.3 trillion for Social Security[2]. Many corporate pension funds rely on annual return assumptions in the 7-8% range[3] to meet future obligations, but such returns are hard to find in the real world today.

It may be prudent for pension funds to increase their exposure to the healthcare sector. After all, healthcare innovation is the single most important factor increasing human lifespan — an important variable affecting pension liabilities. For all developed countries, high life expectancy is also associated with below-replacement fertility, which reduces the ratio of workers to retirees.

Furthermore, healthcare consumption is not only a cause, but is also an effect of lengthening lifespan[4]. The majority of healthcare consumption occurs after the age of 40, and the percentage of the population above the age of 40 is expected to grow exponentially as lifespan increases and fertility falls in the developed world.

Healthcare is poised to be the most significant growth industry of

the century[5] — one of the few asset classes, if not the only one, that can generate consistently higher returns than the 7– 8% modeled by pension funds. Declining, aging population is a demographic headwind for most investment assets classes but for healthcare it's a demographic tailwind.[6]

Investing in the lifespan-promoting healthcare sector allows public and corporate pension funds to isolate the variable that most imbalances their revenues and obligations. Indeed, by enabling a match between returns and liabilities, investing in the healthcare sector may be natural hedge for pension funds.

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Vagal Bias and the Common Cold

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In the context of the common viral illness, human host immunity shifts immune balance towards the virus-fighting Th-1 bias, a process associated with a shift of autonomic balance towards vagal (para-sympathetic) bias. Symptoms typically associated with viral illness such as rhinorrhea, headache (vasoconstriction), cough (bronchospasm), vomiting-diarrhea-abdominal pain (hyper-peristalsis), itchiness, sneezing, congestion (mucus production), and fatigue all represent vagal activity in that system.

Notably, the symptoms of common viral illnesses can be reversed by over-the-counter agents that contain sympathomimetic epinephrine analogues such as ephedrine and phenylephrine. This may also explain why a common side effect of ACE inhibitors, which promote vagal activity, is coughing.[1]

A short course of steroids, which promotes sympathetic function and dampens parasympathetic function, is known to reverse symptoms of other diseases associated with vagal bias such as asthma, eczema, and allergy although the effect takes some time to kick in. It is thus possible that a short course of steroids can ameliorate the symptoms of the common cold too.

Symptoms of the common cold may not be directly caused by the virus, but instead could represent dysfunctional epiphenomena of the host response to the virus. Viewed another way, perhaps the virus is subverting the host autonomic system to activate host responses (coughing, rhinorrhea, mucus production, vomiting, and diarrhea)

that promote emigration possibilities to new hosts given hostilities at home. Perhaps both host and viral agendas are at play.

Many human illnesses (common cold, atopy, eczema, allergy, asthma, and anaphylaxis)[2] may be viewed as spectrum of the same phenomenon associated with vagal (parasympathetic bias). Some (common cold, allergy) are self-limited while others are severe and potentially life threatening (asthma and anaphylaxis). Further explorations of dysfunctional vagal bias in human illnesses as well as mechanisms to correct such conditions through autonomic modulation are warranted.

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Hospital, heal thyself.

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Almost everyone feels ill when thinking about the rising cost of healthcare in this country; it already stands at a gut-churning $2.7 trillion per year.

Similarly, most folks find hospitals uncomfortable, even frightening. Both high costs and low satisfaction share a root cause: Poorly designed medical infrastructure.

If Steve Jobs had been redesigning hospitals instead of computing devices, here are some things he might have done.

- Eliminate doorknobs in medical establishments. Germ theory and knob-less doors have both been around forever.
- Eliminate elevator buttons, cash transactions and other easily replaced vehicles for spreading germs in medical establishments.
- Pediatricians tell patients to avoid having their children share toys and books with sick kids. But what do many pediatricians provide in their waiting rooms?
- Ban bacon and doughnuts in hospital cafeterias. Unpopular, perhaps. But how can healthcare providers preach the value of healthy diets when their own cafeterias serve so much unhealthy food?
- Prevent sleep deprivation among physicians. Recent focus on medical interns has led to improvements, but healthcare providers still envy the sleep rules imposed on pilots.
- Hospital patients prefer private rooms. Hospital-borne infections

prefer shared rooms.

- Noise, visual clutter and poor quality lighting are plentiful in U.S. hospitals. Each one has been demonstrated to harm patient outcomes.

- Pharmacies are a terrible bottleneck in hospitals. Centralized dispensing pharmacies increase drug delivery time by 50%. Do you want your hospital pharmacist to feel rushed?

- More talking, less walking. Nurses spend almost 1/3 of their time walking through rectangular, single corridor units to see patients. Radial units allow nurses to visually supervise patients and spend more time on patient care and communication.

- Disease doesn't respect office hours. Yet hospital staffing is typical of the Monday-through-Friday, 9 a.m.-to-5 p.m, American working culture. Studies show that patients who enter the hospital with stroke or heart disease at night or on weekends have higher mortality than midweek, 9 a.m. – 5 p.m. admissions. It's hard to understand why such straightforward ways to improve patient mortality outcomes are overlooked.

Why does it seem so unlikely that any of these changes are coming very soon to a hospital near you? The system is fraught with misaligned incentives. Thus far, we have no design visionary for healthcare, wearing a black turtleneck and forging game-changing brilliance.

What, then, will actually drive change? Informed consumer demand. Tomorrow's patients will expect hospitals to be reviewed just like any other consumer good, empowering decisions based on patient satisfaction. The health consequences of bad design are well understood by providers; soon, consumers will appreciate that connection, too. And when consumer demand leads to implementation of common sense measures that yield better outcomes, higher satisfaction, and lower costs, I'll be the first to call it "Sanely Great".

Thinking About Design
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To resign means "to leave a position". Look at the word again. Shouldn't resign signify "to sign up again" — a diametrically opposite definition? Perhaps retire is a better word than resign, except retire should actually denote "to tire again", which is hardly the reason most people quit working. If one were to design a word to convey "to leave a position", one might have come up with the word design. We all know that word is already happily married to another definition and is unavailable. And what exactly is the definition of design?

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