Primum non nocere

THOUGHTS ON INNOVATION FROM AN AEROSPACE GROUPIE
My Father’s Plane……
Love at first date...

**Helms Pumped Storage Plant is in its 25th Operating Year**

<table>
<thead>
<tr>
<th>Location</th>
<th>Central California, about 50 miles east of the City of Fresno</th>
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</thead>
<tbody>
<tr>
<td>Commission</td>
<td>June 30, 1984</td>
</tr>
<tr>
<td>Upper Reservoir</td>
<td>Courtright Lake, 123,000 Acre Feet</td>
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<tr>
<td>Lower Reservoir</td>
<td>Lake Wishon, 129,000 Acre Feet</td>
</tr>
<tr>
<td>Installed Capacity</td>
<td>Three units; 1,212 MW generating; 930 MW pumping</td>
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<tr>
<td>Average Energy</td>
<td>&lt;100 GWh per year (natural in-flow)</td>
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</tbody>
</table>

A-Courtright, B-Supply Tunnel, C-Turbine, D-Generator, E-Transformer, F-Wishon, G-Surge Chamber, H-Elevator
The Value Equation

Quality \times \text{Satisfaction} = \text{Value}

\text{Cost}
Sutter four key outcomes

- SAFE: Zero Harm
- PERSONAL: Patient Experience
- ACCESSIBLE: Lives Touched
- AFFORDABLE: Total Cost of Care
Primum non nocere

The Oath of Hippocrates

SWEAR by Apollo the physician, and Aesculapius, and Health, and All-heal, and all the gods and goddesses, that, according to my ability and judgment, I will keep this Oath and this stipulation — to reckon him who taught me this Art equally dear to me as my parents, to share my substance with him, to relieve his necessities if required; to look upon his offspring in the same footing as my own brothers, and to teach them this art, if they shall wish to learn it, without fee or stipulation; and that by precept, lecture, and every other mode of instruction, I will impart a knowledge of the Art to my own sons, and to disciples bound by a stipulation and oath according to the law of medicine, but to none others. I will follow that system of regimen which, according to my ability and judgment, I consider for the benefit of my patients, and abstain from whatever is deleterious and mischievous. I will give no deadly medicine to any one if asked, nor suggest any such counsel; and I will not give a woman a pessary to produce abortion. With purity and with holiness I will pass my life and practise my Art. I will not cut persons labouring under the stone, but will leave this to be done by men who are practitioners of this work. Into whatever houses I enter, I will go into them for the benefit of the sick, and will abstain from every voluntary act of mischief and corruption; and, further, from the seduction of females or males, of freemen and slaves. Whatever, in connexion with my professional practise, or not in connexion with it, I see or hear, in the life of men, which ought not to be spoken of abroad, I will not divulge, as reckoning that all such should be kept secret. While I continue to keep this Oath unviolated, may it be granted to me to enjoy life and the practise of the art, respected by all men, in all times! But should I transgress and violate this Oath, may the reverse be my lot!

From The Glasgow Works of Hippocrates translated from the Greek by Francis Adams, Surgeon, volume 2, London, 1840.
Thalidomide
The Opioid Epidemic
Medical Waste
Sequencing the Human Genome
Implementing CRISPR/Cas9 gene editing

CRISPR/Cas9 ribonucleoprotein complex

- Cas9 protein
- CRISPR gRNA
- Cas9 stable cell line
- Cas9 mRNA
- Cas9 expression plasmid (or lentiviral Cas9)
- Combined expression plasmid (or combined lentiviral expression plasmid)
- sgRNA expression plasmid (or lentiviral sgRNA)
- crRNA/tracrRNA complex (Z-off system)
- in vitro transcribed sgRNA (pfT sgRNA)
- gBlocks® gene fragment (sgRNA expression cassette)
“The greatest danger the world is facing from health professionals is the pressure to investigate, prescribe and intervene in non-existing or futile clinical disorders and diseases”

*Primum non nocere, has now distorted*

Now it seems to suggest

“We can do as much harm, as long as it is scientific”

*Primum non nocere*

First, do no harm!
Thank you

What thoughts do you have for me