Lessons Learned By A Creative Physician-Inventor And How Artificial Intelligence Will Change Vascular Practice And The World

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Conflict of Interest

• Consultant / Independent Contractor
• Boston Scientific
• Stock Shareholder
  • Analytics 4 Life
  • Calgary Scientific
  • Cohesic
  • Harmonic Medical
  • Ikomed Medical
  • Innovere Medical
  • Zymeworks

Follow The Money

• Present financial realities have decreased relative Investment in new devices
• Innovation 2019 directed to
  • Efficiencies
  • Quantum leap in efficacy
  • Safety
• Documenting efficacy for existing devices

Phase Energy Analysis for Assessment of CAD

Replacing / Reducing Testing in the CAD Diagnosis Pathway
Stethoscope
Unchanged Since 1751

ARTIFICIAL INTELLIGENCE
• Can be taught to recognize catheters, guidewires and contrast
• Enables sub-second coning to an ROI
• 1 / second open to full field

Results – AI enabled fluoroscopy in GI procedures

<table>
<thead>
<tr>
<th></th>
<th>Conventional Fluoroscopy (n = 50)</th>
<th>AI enabled Fluoroscopy (n = 50)</th>
<th>Dose Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Dose</td>
<td>5708 mGy/m²</td>
<td>2178 mGy/m²</td>
<td>61.8% (p=0.001)</td>
</tr>
<tr>
<td>Median Range</td>
<td>473 - 22017</td>
<td>4792 - 24969</td>
<td></td>
</tr>
</tbody>
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Cumulative Scatter Dose
- Conventional Fluoroscopy: 0.69 mSv
- AI enabled Fluoroscopy: 0.28 mSv

Dose Reduction: 59.4%

• No difference in fluoroscopic image quality
Moore's Law

Intel co-founder Gordon Moore

- 1965 - number of transistors on a chip doubles every year while the costs are halved
- Now - overall processing power for computers will double every two years while costs decrease

The Terrifying Reality Of Moore’s Law

AI And Cardiovascular Disease

Goal - treating, preventing and ultimately beating coronary heart disease

Conclusion – AI In Vascular Interventions

- AI will change / is changing virtually every aspect of our lives
- In interventional medicine
  - Enforcement adherence to guidelines / billing
  - Improved
    - patient assessment
    - imaging
    - efficiency