Listen to your heart- A physician’s journey in self-diagnosis

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Philadelphia FIGHT Community Health Centers
Disclosures

- I have no disclosures
The Clinicopathologic Conference

- Introduced in US at Harvard in early 1900s
- Arose from the use of case history in the teaching of law
- Walter Cannon wrote in 1900-“the study of case histories...arouses great enthusiasm and excitement among students”
Dr. Richard Cabot
Clinical Presentation

- 60 year old man developed
  - Acute left leg weakness and pain
  - Presented to ED within 1 hour of symptoms
  - Vital signs normal
  - Neurological exam—Oriented times 3, CNs normal, UE strength and sensation normal, left leg with mild distal weakness
Stroke protocol initiated

- Ct scan
- MRI

Both showed no evidence of an acute ischemic event, but had evidence of a “possible left sided aneurysm in the parietal region”
Diagnosis

- TIA
- Prescriptions for aspirin and high dose atorvastatin
- Recommended Neurology follow up and repeat MRI
- The following day a diagnostic test was performed
AHA ACLS Adult Suspected Stroke Algorithm

ID Stroke Signs and Symptoms ------- Activate EMS

Important Prehospital Interventions

Important Interventions at Hospital Arrival
Interventions should occur within 10 minutes of arrival.

Neurological Assessment & Stroke Team Evaluation
Interventions should occur within 25 minutes of arrival.

Head CT scan completed in 25 minutes and read within 45 minutes

No Head Bleed

Possible Ischemic Stroke
Fibrinolytic Therapy Options/Exclusions

Qualifies for Fibrinolytic Therapy

Give rtPA within 60 minutes

Initiate post-rtPA stroke pathway. Admission to ICU or stroke unit within 3 hours of arrival.

Yes

No

Give aspirin

Consult Neurologist; Move to increased level of care.

Begin stroke or hemorrhage pathway of stroke protocol.

Head Bleed
Goals for EMS Provider Care of Stroke Patients

1. Improve knowledge of identification of stroke signs and symptoms.
2. Develop a rapid assessment process.
3. Facilitate transfer of stroke victims to Primary Stroke Centers in the quickest and safest manner.
4. Pre-notify the Stroke Center, “Possible acute stroke in route.”
5. Encourage family members familiar with the patient care to either ride with the transfer vehicle or drive to the stroke center ASAP to provide more patient information.
Goals for EMS Provider Care of Stroke Patients

6. Obtain reliable list of meds taken or bring bag of all medications taken.
7. Obtain a set of vital signs and finger stick blood sugar at the site.
8. Reliably identify family’s best estimation of when the patient was “last seen normal”.
9. Administer the Cincinnati Pre-hospital Stroke Scale.
10. Provide the receiving facility with a quick, complete verbal report that incorporates the information obtained since arrival on scene.
Goals for Treatment in the ED

- EMS rapid identification & pre-notification of the Emergency Dept.
- Quick evaluation in ED.
- Last seen normal < 3 hr.
- Door-to-CT scan < 25 minutes
- CT-to-Radiologist Reading < 20 minutes
- IV TPA administration < 15 minutes
- (Door-to-needle within 60 minutes.)
Cardiac examination!

- 4/6 holosystolic murmur radiating throughout the precordium
- Echo-demonstrated mitral valve prolapse with a valvular vegetation and severe regurgitation
The Role of Physical Examination

- Decline in physical examination skills
  - Improvements in technology
  - Time constraints
  - Lack of confidence in PE skills leading to uncertainty
  - Consequence—delayed or incorrect diagnosis

Asif T, et al, Cureus, 2017
Decline in Examination Skills

- Trainees spending as little as 12% of time in direct contact with patients
- Less confidence in exam skills
- Perception that technology is better than exam
- Exam skills being taught as a list of maneuvers regardless of clinical context

Consequences of Inadequate Physical Examination

- Types of errors/oversights in physical examination
- Qualitative survey of case vignettes
- 208 completed vignettes
  - 63% - PE not performed
  - 14% - Misinterpretation of PE finding
  - 11% - PE finding was missed or not sought

Time to Discovery of PE oversights

Figure 2: Distribution of time to discovery for 208 oversights in physical exam.
Reinvigorating the physical exam

- Be present with the patient
- Practice an evidence-based approach to the exam
- Create opportunities for the intentional practice of the physical exam
- Recognize the power of the exam beyond diagnosis
- Use of point-of-care technology to aid in diagnosis
- Seek and provide specific feedback on physical examination skills

Society of Bedside Medicine (https://bedsidemedicine.org/)
Specific interventions

- Hypothesis driven physical exam
  - The performance of specific PE maneuvers that may alter the likelihood of a disease in a particular patient
  - Teaching exam skills in a context specific manner rather than as head-to-toe

Garibaldi and Olson, Med Clin N Am 102 (2018)
Basics of the Hypothesis Driven PE

- Determination of pre-test probabilities
- Likelihood ratios for selecting particular maneuvers
- Arriving at a post test probability
- Multiple examination findings can be combined if they are physiologically independent (ie-splenomegaly and jaundice in considering a diagnosis of cirrhosis)

Garibaldi and Olson, Med Clin N Am, 2018
Conceptual Framework for the Physical Exam
Zaman, Verghese, and Elder, Southern Medical J, 2016

Physical Examination

- Diagnostic accuracy
- Ongoing care and prognosis
- Cost
- Patient safety
- Patient contact
- Pedagogic value
- Accessibility
A New Conceptual Framework for PE

- Diagnostic Accuracy - Pulsatile mass
- Ongoing care and prognosis—CVA
- Patient Contact—inherently patient centered
- Accessibility—requiring only hands, eyes, ears and mind
- Pedagogic value
- Cost
- Patient Safety

Zaman, Verghese and Elder, Southern Med J, 109,754
Further Diagnostic Tests

- Blood cultures—all negative
- MRI of Leg—myositis
- Cath—clot in left leg
- Led to mitral valve repair
“A small number of diseases present such serious difficulties of diagnosis than malignant endocarditis, difficulties that in many cases are insurmountable.”

“Gulstonian Lectures on Malignant Endocarditis”

W. Osler 1885
### Clinical Signs and Symptoms

#### Signs and Symptoms of Infective Endocarditis

<table>
<thead>
<tr>
<th>Presenting Sign or Symptom</th>
<th>% of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>80 to 90</td>
</tr>
<tr>
<td>Heart murmur</td>
<td>85</td>
</tr>
<tr>
<td>Skin manifestations</td>
<td>18 to 50</td>
</tr>
<tr>
<td>Embolic phenomena</td>
<td>&gt; 50</td>
</tr>
<tr>
<td>Splenomegaly</td>
<td>20 to 57</td>
</tr>
<tr>
<td>Clubbing of fingers</td>
<td>12 to 52</td>
</tr>
<tr>
<td>Chills</td>
<td>40</td>
</tr>
<tr>
<td>Weakness</td>
<td>40</td>
</tr>
<tr>
<td>Dyspnea</td>
<td>40</td>
</tr>
<tr>
<td>Sweats</td>
<td>25</td>
</tr>
<tr>
<td>Anorexia</td>
<td>25</td>
</tr>
<tr>
<td>Weight loss</td>
<td>25</td>
</tr>
<tr>
<td>Malaise</td>
<td>25</td>
</tr>
<tr>
<td>Cough</td>
<td>25</td>
</tr>
<tr>
<td>Nausea/vomiting</td>
<td>20</td>
</tr>
<tr>
<td>Headache</td>
<td>20</td>
</tr>
<tr>
<td>Myalgia/arthralgia</td>
<td>15</td>
</tr>
<tr>
<td>Chest pain</td>
<td>15</td>
</tr>
<tr>
<td>Abdominal pain</td>
<td>15</td>
</tr>
<tr>
<td>Retinal lesion</td>
<td>2 to 10</td>
</tr>
</tbody>
</table>
A "definite" diagnosis of endocarditis can be made if two major criteria, one major and three minor criteria, or five minor criteria are met.

### Duke Criteria for Clinical Diagnosis of IE

<table>
<thead>
<tr>
<th>Major Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Positive blood cultures from at least two separate cultures drawn 12 hours apart</td>
</tr>
<tr>
<td>• Evidence of IE on echocardiogram (eg, a vegetation, abscesses or valve perforation)</td>
</tr>
<tr>
<td>• New regurgitant murmur</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Minor Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Predisposing heart condition such as mitral valve prolapse, rheumatic or congenital heart disease, or intravenous drug abuse</td>
</tr>
<tr>
<td>• Temperature &gt; 100.4°F (38°C)</td>
</tr>
<tr>
<td>• Presence of embolic disease or hemorrhage</td>
</tr>
<tr>
<td>• Presence of immunologic phenomena (eg, glomerulonephritis, Osler’s nodes, Roth’s spots, rheumatoid factor)</td>
</tr>
<tr>
<td>• Positive blood cultures but major criteria are not met</td>
</tr>
<tr>
<td>• Echocardiogram is positive but major criteria are not met</td>
</tr>
</tbody>
</table>
Complications

• Congestive heart failure is only one aspect of IE that explains the high mortality rate.

• When the vegetations grow as the infection proceeds, small pieces may break off, travel through the blood, and become lodged in other locations throughout the body.

• These locations include:
  - The intestines
  - The lungs
  - The kidneys
  - The liver
  - The brain

Systemic embolization is found in 22-50% of cases of IE.
Figure 1

SUSPECTED INFECTIVE ENDOCARDITIS

Acute Endocarditis Syndrome?

CLINICAL ASSESSMENT

NO

Subacute Endocarditis Syndrome?

YES

Draw 2 or 3 blood cultures, 5 min apart, treat immediately with antibiotics; do echo and other tests; observe progress, and consider alternative diagnoses

NO

Investigate for other possible diagnoses, including infections

Draw 3 blood cultures 1 h apart; perform echo and other tests; withhold antibiotic therapy for 24–48 h

Blood Cultures Positive?

YES

Treat immediately with antibiotics for endocarditis

NO

Endocarditis still likely after 24–48 h?

YES

Evaluate for culture-negative endocarditis; draw 2 further blood cultures; begin antibiotic treatment; observe progress, and consider alternative diagnoses

NO

Observe progress, consider alternative diagnoses
Investigations:

Blood culture - Minimum of 3 samples from 3 different sites (gap of 1 hour between first and last sample). For Atypical organisms – over 24 hours.

Complete blood count
Liver function, Renal function, Electrolytes
Inflammatory markers – ESR, CRP
Urine – hematuria
Immunoglobulins – increased
Complement level – decreased
ECG (MI or AV block), CXR, Echo – TTE, TOE
Culture negative endocarditis - occurs in 5 to 10%.
May be due to previous antibiotic therapy. May be due to organisms failing to grow in normal cultures – Coxiella burneti, Chlamydia, Bartonella, Legionella
<table>
<thead>
<tr>
<th>Condition</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rheumatic heart disease</td>
<td>197pt</td>
<td>48.3%</td>
</tr>
<tr>
<td>Congenital heart disease</td>
<td>31pt</td>
<td>7.6%</td>
</tr>
<tr>
<td>Degenerative heart disease</td>
<td>17pt</td>
<td>4.2%</td>
</tr>
<tr>
<td>Prosthetic valves</td>
<td>49pt</td>
<td>12.0%</td>
</tr>
<tr>
<td>Bulging (prolapse) of mitral v.</td>
<td>8pt</td>
<td>2.0%</td>
</tr>
<tr>
<td>Immanent pacemaker</td>
<td>2pt</td>
<td>0.5%</td>
</tr>
<tr>
<td>Intact valves</td>
<td>105pt</td>
<td>25.7%</td>
</tr>
</tbody>
</table>
IE, period of determining the diagnosis

The average period – 1.7 months

Diagnosis

- Surgery—Prolapsed mitral valve with vegetation
- Microbiology—Cultures of blood and tissue negative
Diagnostic testing for identification of the microbiological etiology of infective endocarditis.

Illness in Providers

- Illness isn’t appropriate in medical providers
- Disclosure of illness becomes an admission of weakness
- Providers will not seek support for health problems
- When the stigma of illness is not addressed, the opportunity to demonstrate the value of experiencing life as a patient is lost
Effect of medical illness on providers

- Medical students facing personal illness perceived as being more empathetic, mature, and better learners overall
- Medical education doesn’t currently create formal opportunities to acknowledge the value of that life experience
- Instead of viewing illness as a source of weakness, we first need to reframe it as a source of expertise
Burnout

- What is happening to doctors?

- “Life is never made unbearable by circumstances, but only by lack of meaning and purpose.”
  - Viktor Frankl
Burnout...

Physical, emotional and mental exhaustion caused by long term involvement in emotionally demanding situations
Burnout

- Role Overload – expectations of others exceed one’s ability to perform
- Role Conflict – forced to make a choice about which demand to satisfy
  - ex) child’s soccer game vs. staying late to see patient or complete paperwork
Figure: A model of physician ill health and the links with health-care system outcomes, and potential interventions to improve physician and system outcomes. Solid lines are empirically supported; broken lines are potential links.
The cost of a burned out doc

- Effect on patient care and safety
  - Patient medication adherence
  - Physician recommended evidence based screening and health counseling reduced when physicians have poor personal health
- Reduced workplace productivity and efficiency
- Cost of replacing a physician (150-300 K, maybe 1 million)

(Wallace, 2009)
Burnout

- Why is it happening to doctors? To the people who choose to become doctors?

- “I swear by Apollo Physician and Asclepius and Hygieia and Panaceia and all the gods and goddesses, making them my witnesses, that I will fulfil according to my ability and judgment this oath and this covenant:”

  Hippocratic Oath
<table>
<thead>
<tr>
<th>Positive value</th>
<th>Negative potential</th>
<th>Burnout factor(s)</th>
<th>Potential mental training interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service</td>
<td>Deprivation</td>
<td>Compassion fatigue, Entitlement</td>
<td>Reframing, Appreciation and gratitude</td>
</tr>
<tr>
<td>Excellence</td>
<td>Invincibility</td>
<td>Emotional exhaustion</td>
<td>Mindful self-compassion, Inner critic awareness</td>
</tr>
<tr>
<td>Curative competence</td>
<td>Omnipotence</td>
<td>Ineffectiveness, Cynicism</td>
<td>Self-awareness, Generous listening</td>
</tr>
<tr>
<td>Compassion</td>
<td>Isolation</td>
<td>Depersonalization</td>
<td>Connection and community, Silence as energizing</td>
</tr>
</tbody>
</table>

(Nedrow 2012)
## Compassion Fatigue (CF)

<table>
<thead>
<tr>
<th>Definition</th>
<th>Contributing Factors</th>
</tr>
</thead>
</table>
| • State of exhaustion and dysfunction (biologically, psychologically, and socially) as a result of prolonged exposure to secondary trauma or a single intensive event | • Helplessness  
  • Feeling incapable of effecting successful patient outcomes  
• Confusion  
• Isolation  
• Exhaustion  
• Feeling of being overwhelmed by work |
Self care – Doctors are miserable at this

• Less doctor visits for themselves
  • Self-prescribe drugs (i.e. will not see a doctor)
  • Perceived (?) stigma around seeking help or support

• Willing to work when sick… and expect the same from colleagues (but not patients)

• Denial and avoidance – physician coping strategies
  • Poor record of mutual support and positive feedback in the field
  • Protecting the privacy of colleagues
  • Doctors are self-reliant, individually driven, achievers who are industrious and self-sacrificing

(Wallace, 2009)
<table>
<thead>
<tr>
<th>Stress</th>
<th>Burnout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characterized by overengagement</td>
<td>Characterized by disengagement</td>
</tr>
<tr>
<td>Emotions are overreactive</td>
<td>Emotions are blunted</td>
</tr>
<tr>
<td>Produces urgency and hyperactivity</td>
<td>Produces helplessness and hopelessness</td>
</tr>
<tr>
<td>Loss of energy</td>
<td>Loss of motivation, ideals, and hope</td>
</tr>
<tr>
<td>Leads to anxiety disorders</td>
<td>Leads to detachment and depression</td>
</tr>
<tr>
<td>Primary damage is physical</td>
<td>Primary damage is emotional</td>
</tr>
<tr>
<td>May kill you prematurely</td>
<td>May make life seem not worth living</td>
</tr>
</tbody>
</table>

Source: *Stress and Burnout in Ministry*
### Heading off the rails…

<table>
<thead>
<tr>
<th>Emotional exhaustion</th>
<th>Fatigue, insomnia, impaired concentration, somatic symptoms, repeated illness, loss of appetite, anxiety, depression, anger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeling low personal accomplishment</td>
<td>Loss of enjoyment, pessimism, sarcasm (in excess), isolation, detachment</td>
</tr>
<tr>
<td>Depersonalization of the patient</td>
<td>Apathy, irritability (with staff, trainees, patients), lack of productivity</td>
</tr>
</tbody>
</table>
10 commandments of physician wellness

I. Thou shall not expect someone else to reduce your stress.
II. Though shall not resist change.
III. Thou shall not take thyself in vain.
IV. Remember what is holy to thee.
V. Honor thy limits.
VI. Thou shall not work alone.
VII. Thou shall not kill or take it out on others.
VIII. Thou shall not work harder. Thou shall work smarter.
IX. Seek to find joy and mastery in thy work.
X. Thou shall continue to learn.
Choice…

• #1: Thou shall not expect someone else to reduce your stress.

• “Between stimulus and response, there is a space. In that space is our power to choose our response. In our response lies our growth and our freedom.”
  
  • Viktor Frankl.
  • Man’s Search for Meaning
Benefits of Meditation

- The primary health benefit from meditation practices appears to be a general shift in the autonomic nervous system that decreases sympathetic tone and increases parasympathetic tone.

- As the parasympathetic system is stimulated, heart rate and breathing slow, stress hormones decrease, blood vessels dilate, and digestion is facilitated.

- Depression
- Anxiety
- Sleep
- Immune Function
- Cortisol Levels
- Decision Making
- Coping
Acknowledgments

- JBHC Team
- Philadelphia FIGHT Leadership
- My patients
- My family