Exercise is Effective but Underutilize Medicine

Lucas Carr, PhD
Britt Marcussen, MD
Melanie Cuchna, MPH, MCHES
# Health Hazards Associated with Physical Inactivity

<table>
<thead>
<tr>
<th>Health Hazard</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Blood Pressure</td>
<td></td>
</tr>
<tr>
<td>Increased risk of Chest pain &amp; Heart attack at younger age</td>
<td></td>
</tr>
<tr>
<td>Risk of getting Diabetes mellitus at early age</td>
<td></td>
</tr>
<tr>
<td>Weight gain and Obesity</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Health Hazard</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td></td>
</tr>
<tr>
<td>Inflammation (Aches and pains in the body)</td>
<td></td>
</tr>
<tr>
<td>Dysfunction of Immune system</td>
<td></td>
</tr>
<tr>
<td>Weak Bones and increased risk of Fractures</td>
<td></td>
</tr>
<tr>
<td>Decrease in muscle mass and strength</td>
<td></td>
</tr>
<tr>
<td>Physical Disability</td>
<td></td>
</tr>
</tbody>
</table>
Physical Inactivity Associated with a higher risk for severe COVID-19 outcomes

- N=48,440 adult patients with at least 3 exercise vital sign measurements AND a COVID-19 diagnosis in 2020
- Compared patients who were consistently inactive vs. patients who were consistently meeting PA guidelines

Among Inactive Patients

- Hospitalization OR=2.26
- Admission to ICU OR=1.73
- Death OR=2.49

Risk of hospitalization for those with BMI>40 OR=1.77

Sallis et al., BMJ, 2021
https://bjsm.bmj.com/content/55/19/1099
Inactive patients have significantly higher hospital charges compared to active patients.

### Chart

<table>
<thead>
<tr>
<th>Category</th>
<th>Hospital Charges ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inactive (0 mins/wk MVPA)</td>
<td>$4,375</td>
</tr>
<tr>
<td>Insufficiently Active (&lt;150 mins/wk MVPA)</td>
<td>$3,512</td>
</tr>
<tr>
<td>Sufficiently Active (≥ 150 mins/wk MVPA)</td>
<td>$2,369</td>
</tr>
</tbody>
</table>

84% increase in hospital charges for inactive patients.

† The cost imposed on system for providing the care received.

*Mean PA reported during 2 yrs prior to summed annual hospital costs  N = 1,195,407 person-years; 459,313 persons

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Irrefutable Evidence Supports Health Benefits of Regular Physical Activity

Immediate
- Sleep
  Improves sleep quality
- Less Anxiety
  Reduces feelings of anxiety
- Blood Pressure
  Reduces blood pressure

Long-Term
- Brain Health
  Reduces risks of developing dementia (including Alzheimer’s disease) and reduces risk of depression
- Heart Health
  Lowers risk of heart disease, stroke, and type 2 diabetes
- Cancer Prevention
  Lowers risk of eight cancers: bladder, breast, colon, endometrium, esophagus, kidney, lung, and stomach
- Healthy Weight
  Reduces risk of weight gain
- Bone Strength
  Improves bone health
- Balance and Coordination
  Reduces risks of falls

Piercy et al., JAMA, 2018 – Physical Activity Guidelines for Americans

The University of Iowa
Physically Active Patients have Fewer Future Hospitalizations

Most active participants had **12%** lower likelihood of spending more than 20 days in hospital over the next 20 years vs. those reporting no activity.

Patients reporting ANY activity had **0.42** fewer days in the hospital per year.

Exercise is Medicine!!!

But Underutilized in Primary Care 😞
Physical Inactivity is the Most **Common** and **Preventable** Risk Factor But Receives Least Attention in Healthcare

<table>
<thead>
<tr>
<th>Rank</th>
<th>Risk Factor</th>
<th>% Deaths Attributed</th>
<th>Prevalence among adults in U.S.</th>
<th>Measured in Primary Care?</th>
<th>Prevented or Improved with Physical Activity?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hypertension</td>
<td>13%</td>
<td>10%</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>Tobacco</td>
<td>9%</td>
<td>13%</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>3</td>
<td>High Blood Glucose</td>
<td>6%</td>
<td>13%</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>4</td>
<td><strong>Physical Inactivity</strong></td>
<td><strong>6%</strong></td>
<td><strong>76%</strong></td>
<td>✗</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Obesity</td>
<td>5%</td>
<td>42%</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>6</td>
<td>High Cholesterol</td>
<td>5%</td>
<td>10%</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

WHO, Global Recommendations on Physical Activity for Health, Geneva, 2010
Question:

*If exercise is so great, why don’t we measure or treat it?*
Documented Barriers to Implementation

• **Lack of Clinical Time**  (Berra et al., *JAMA*, 2015)
  - EVS designed to minimize disruption on clinical workflow (<30 sec)  
    (Golightly et al., *Prev Chonic Disease*, 2017)
  - Exercise prescription = 15 minutes  (Petrella et al., *Can Fam Phys*, 2010)

• **Lack of Training on Exercise Counseling**  (Sallis, *TPAS*, 2015; Clark et. al., *Osteo Int*, 2017)
  - [ACSM Healthcare Action Guide](https://uicapture.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=630dc0da-a9a9-4be1-af34-ae890140ba0c)

• **Lack of Reimbursement Options**  (Lobelo et al., *Circulation*, 2018)
Exercise is Medicine® Initiative

1. Healthcare providers **screen for physical inactivity** at every clinic visit.

2. Provide patients with **exercise prescription OR brief counseling** to help patient meet guidelines.

3. **Refer** patient to community-based resources for physical activity (PA) counseling.

American College of Sports Medicine, 2007
Step 1. **Assess** Physical Activity at Every Visit Integrate into Epic

**Exercise Vitals**

During the rooming process, after standard vitals (BP, HR, O2) are taken, you now have access to ask the patient two questions about their physical activity, located in the Rooming Tab. If the patient gets less than 150 minutes/week, it flags in the Flowsheet but not the link that is pulled into the note.

**Nursing:** Ask the patient the two questions below

**Minimal Disruption to Clinical Workflow**
2 items, <30 seconds to administer
Golightly et al., *Prev Chonic Disease*, 2017

**Administered in Family Medicine since 2018**

15,000 data points to date
### PAVs Predicts Patient Disease Risk

N=34,712

#### Table 1  Characteristics of a Clinic’s Adult Primary Care and Internal Medicine Outpatient Visits During Which the Physical Activity Vital Sign was Administered and Recorded, November 2011 to November 2013

<table>
<thead>
<tr>
<th></th>
<th>N (%)</th>
<th>Mean clinic visits per year (SD)</th>
<th>Median self-reported mins-wk^-1 MVPA (IQR)</th>
<th>% Sufficiently Active</th>
<th>% Insufficiently Active</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>34,712 (100)</td>
<td>2.1 (1.0)</td>
<td>100 (15–200)</td>
<td>38.7</td>
<td>61.3</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>15,163 (43.7)</td>
<td>2.0 (1.0)</td>
<td>120 (40–240)</td>
<td>45.0</td>
<td>55.0</td>
</tr>
<tr>
<td>Female</td>
<td>19,548 (56.3)</td>
<td>2.2 (1.0)</td>
<td>90 (0–180)</td>
<td>33.9</td>
<td>66.1</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–29</td>
<td>2362 (6.8)</td>
<td>1.2 (0.5)</td>
<td>150 (80–270)</td>
<td>54.2</td>
<td></td>
</tr>
<tr>
<td>30–39</td>
<td>3281 (9.5)</td>
<td>1.5 (0.7)</td>
<td>120 (60–240)</td>
<td>44.2</td>
<td></td>
</tr>
<tr>
<td>40–49</td>
<td>3937 (11.3)</td>
<td>1.7 (0.9)</td>
<td>120 (40–225)</td>
<td>43.5</td>
<td></td>
</tr>
<tr>
<td>50–64</td>
<td>9960 (28.7)</td>
<td>2.1 (0.9)</td>
<td>100 (20–200)</td>
<td>38.4</td>
<td></td>
</tr>
<tr>
<td>≥65</td>
<td>15,172 (43.7)</td>
<td>3.1 (1.2)</td>
<td>90 (0–180)</td>
<td>34.1</td>
<td>65.9</td>
</tr>
<tr>
<td><strong>BMI</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;18.5</td>
<td>409 (1.4)</td>
<td>1.7 (0.9)</td>
<td>90 (0–210)</td>
<td>37.9</td>
<td>62.1</td>
</tr>
<tr>
<td>18.5–24.9</td>
<td>7488 (25.0)</td>
<td>1.8 (0.9)</td>
<td>120 (40–225)</td>
<td>45.9</td>
<td>54.2</td>
</tr>
<tr>
<td>25–29.9</td>
<td>9268 (30.9)</td>
<td>2.0 (0.9)</td>
<td>120 (30–225)</td>
<td>42.9</td>
<td>57.1</td>
</tr>
<tr>
<td>30–34.9</td>
<td>6443 (21.5)</td>
<td>2.3 (1.0)</td>
<td>90 (0–180)</td>
<td>34.2</td>
<td>65.8</td>
</tr>
<tr>
<td>35–39.9</td>
<td>3280 (10.9)</td>
<td>2.4 (1.0)</td>
<td>60 (0–150)</td>
<td>27.7</td>
<td>72.3</td>
</tr>
<tr>
<td>≥40</td>
<td>3104 (10.4)</td>
<td>2.9 (1.2)</td>
<td>45 (0–120)</td>
<td>20.8</td>
<td>79.2</td>
</tr>
<tr>
<td><strong>Charlson Index</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>8289 (23.9)</td>
<td>1.4 (0.6)</td>
<td>150 (60–240)</td>
<td>50.3</td>
<td>49.7</td>
</tr>
<tr>
<td>1</td>
<td>6622 (19.1)</td>
<td>1.8 (0.8)</td>
<td>120 (40–225)</td>
<td>43.8</td>
<td>56.3</td>
</tr>
<tr>
<td>2–4</td>
<td>11,358 (32.7)</td>
<td>2.6 (1.0)</td>
<td>90 (0–180)</td>
<td>37.0</td>
<td>63.0</td>
</tr>
<tr>
<td>≥5</td>
<td>8443 (24.3)</td>
<td>4.0 (1.4)</td>
<td>60 (0–150)</td>
<td>25.8</td>
<td>74.3</td>
</tr>
</tbody>
</table>

*Strong discriminant validity*
Coleman et al., MSSE, 2012
UIHC Family Medicine Launched on 11/27/18

- During the check in process during annual physicals, Family Medicine nursing staff will ask the patients two questions about exercise:

  - **Helpful Scripting, if necessary:** Our providers take your health very seriously. Regular exercise is one of the best things you can do for your health. How many days a week do you exercise and for how many minutes on average do you exercise?

- Nursing will have these two questions in ‘Rooming’ and LIPs will have these questions in ‘screenings’
PAVS now in Epic and Can be Adopted by All UIHC Clinics

If the patient doesn’t reach 150 minutes of Moderate to Strenuous Exercise each week, the calculation will be in red with an exclamation by it.

The flowsheet row will populate into the Family Medicine Clinic Note System Template under Vitals Signs or providers can manually enter the answers by adding .EXERCISEVITALS.
Step 2. **Advise** and/or Counsel on Physical Activity

2018 Physical Activity Guidelines for Adults:
- 150-300 minutes/week of moderate-intensity activity or 75-150 minutes/week of vigorous activity (somewhat hard to very hard) or a combination of both
- Muscle strength training 2 or more times a week

### Aerobic Activity (check)

- **Frequency (days/week):**
  - [ ] 1
  - [ ] 2
  - [ ] 3
  - [ ] 4
  - [ ] 5
  - [ ] 6
  - [ ] 7
- **Intensity:**
  - [ ] Light (casual walk)
  - [ ] Moderate (brisk walk)
  - [ ] Vigorous (like jogging)
- **Time (minutes/day):**
  - [ ] 10
  - [ ] 20
  - [ ] 30
  - [ ] 40
  - [ ] 50
  - [ ] 60 or more
- **Type:**
  - [ ] Walk
  - [ ] Run
  - [ ] Hike
  - [ ] Swimming/Water Exercise
  - [ ] Other
- **Steps/day:**
  - [ ] 2,500
  - [ ] 5,000
  - [ ] 7,500
  - [ ] 9,000 or more
  - [ ] Other

### Muscle Strength Training (check)

- **Frequency (days/week):**
  - [ ] 1
  - [ ] 2
  - [ ] 3
  - [ ] 4
  - [ ] 5
  - [ ] 6
  - [ ] 7

### What about aerobic activity?
- Moderate activity is at a pace where you can talk but cannot “sing.” Examples: brisk walking, light hiking, water exercise and dancing.
- Vigorous activity is done at a pace where you can say more than a few words without pausing for a breath. Examples: jogging, swimming, tennis and fast bicycling.
- You can exercise for any length of time. For example, you might walk:
  - 30 minutes 5 days/week or
  - 20 minutes daily
  - 5 minutes here, 10 minutes there, just work your way up to 150 total minutes/week.
- Your ultimate goal is to gradually build up to 7,000-9,000 steps/day.

### What about strength training?
- You don’t have to go to a gym. Try elastic bands, do body weight exercises (chair sit-to-stands; floor, wall or kitchen chair push-ups; planks or Bridges) or lift dumbbells.
- Heavy work around your home or yard also builds strength.
- Strengthen your legs, back, chest and arms. To start, try 10-15 repetitions using light effort. Build up to medium or hard effort for 8-12 repetitions. Repeat 2-4 times, 2-3 days/week.
- Give yourself a rest day between each strength training session.

### Prescriber’s Signature:

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Schmitz et al., Exercise Is Medicine in Oncology: Engaging Clinicians to Help Patients Move Through Cancer. CA CANCER J CLIN 2019;69:468–484
Simple Primary Care Physical Activity Interventions Are Welcomed and Effective

46-50% of patients surveyed welcomed advice on physical activity from a health care professional (Morton et al., *London J Prim Care*, 2016; Falskog et al., *Scan J Primary Care*, 2021)

**Review of Reviews:** Physical activity promotion interventions in primary care result in small-moderate positive effects on PA levels

(Sanchez et al., *Prev Med*, 2015)
USPSTF Recommends Behavioral Counseling to Prevent CVD in Adults with CVD Risk Factors (Grade B)

- **Recommendation**: offer or refer adults with CVD risk factors to behavioral counseling interventions to promote a healthy diet & physical activity

- **Grade**: B

- **USPSTF concludes** that behavioral counseling has a "moderate net benefit on CVD risk in adults with increased risk for CVD"

- **Types of interventions promoted**: group counseling sessions over extended time, 1-on-1 sessions, motivational interviewing, meetings with other specialty services
• **Recommendation:** USPSTF recommends clinicians individualize the decision to offer or refer adults without CVD risk factors to behavioral counseling interventions to promote a healthy diet and physical activity.

• **Grade:** C

• **USPSTF concludes** behavioral counseling has a "small net benefit on CVD risk in adults without CVD risk factors"

• **Types of interventions promoted:** group counseling sessions over extended time, 1-on-1 sessions, motivational interviewing, meetings with other specialty services
3. **Refer** Patient to Community Resources

**Free Health Coaching**

Ready to make a change?
The University of Iowa offers FREE health coaching for individuals interested in making lifestyle behavior changes.

REQUEST FREE COACHING HERE

https://tiny.cc/health-coach

OR

SCAN THIS QR CODE

**COACHING CAN HELP:**
- Increase energy
- Build confidence
- Better sleep
- Improve nutrition
- Moving more
- Enhance mental well-being
- Positive connections

Health coaches are available to help you reach your health-related goals. Visits are free and confidential.

IOWA
Adult Wellness Visit

Patient reports ≥ 150/wk MVPA

- Physical Activity Vital Sign Administered by MA

Patient reports < 150/wk MVPA

Abnormal Vital Flagged

BPA alerts provider "Exercise rec’s not met and to ask patient if they want to meet healthcoach"

If YES to health coach:
QR code to Health Coaching Request Survey added to After Visit Summary and MyChart
https://tiny.cc/health-coach

If NO to health coach

Abnormal Vital Flagged
Inadequate Exercise populates the visit Dx and Problem List

UI Employee

- Health Coach

UI Student

- Health Coach

Not UI student or employee

- Health Coach

Adequate Exercise populates visit Dx and Problem List

Patient reports ≥ 150/wk MVPA

Adequate Exercise populates visit Dx and Problem List

Patient reports < 150/wk MVPA

BPA alerts provider "Exercise rec’s not met and to ask patient if they want to meet healthcoach"
liveWELL Health Coaching (Employees)

Support and Accountability

Health Coaching is a nonjudgmental, collaborative process where the coach supports the individual in making healthy lifestyle changes in areas such as increasing energy, nutrition, exercise, and stress management.

- 5 free visits plus 1 month and 3 month follow up visits per 12 months
- UI employees
- Appointments available at Campus Recreation and Wellness Center (CRWC), Employee Health Clinic (Boyd Tower), and on Zoom
- Evening appointments available

Referrals to well-being programs

- Mindfulness Bases Stress Reduction Program
- Personal Training
- Lifestyle Change Programs
  - CDC’s Diabetes Prevention Program (DPP)
  - 10-Week Lifestyle Change Program through Wondr Health
- Employee Assistance Program
- Financial Coaching/Consultations
- Caregiving Resources

hr.uiowa.edu/livewell/health-coach-service
UI Student Wellness Health Coaching (Students)

- Free for UI Students
- Visits every 2 weeks with Student Wellness Staff Member
- Zoom, CRWC, Westlawn

https://studentwellness.uiowa.edu/appointments/wellness-coaching
Community Health Collaborative Health Coaching (Non-UI Employees/Students)

- Up to 5 free visits
- Remote (Zoom)
- Trained student health coaches
- For non-UI employees/students

https://chtc.sites.uiowa.edu/health-coaching
Evidence to Support Health Coaching But Research Still Early

• **Physical activity:** Small, positive, statistically significant effect of health coaching on physical activity measured as a continuous variable in steps or minutes compared with an inactive control.

• **Weight management:** Small, positive, statistically significant effect of health coaching on reductions in BMI compared with an inactive control.

• **Diet:** Small, positive effects of health coaching on decreasing fat intake in quantitative analysis and total calories in qualitative synthesis. Results were mixed for effect on fruit and vegetable intake, and only one study found a positive effect on diet adherence.

• **Medication adherence:** 1 of 3 trials found health coaching was associated with a significant improvement in medication adherence.

Gierisch et al., Dept Veterans Affairs, 2017
https://www.ncbi.nlm.nih.gov/books/NBK487697/
Acknowlegdements

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Thank you.