

## Online Supplementary Material

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## Supplemental Appendix. 5As Direct Observation Code for Physical Activity

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## 1.0 BACKGROUND

### 1.1 Brief History of the 5As Strategy

Although the 5As have been endorsed as a unifying framework for behavioral counseling in primary care,<sup>1-5</sup> the model has its roots specifically in smoking cessation. Originally developed by the National Cancer Institute<sup>6</sup> as the Four As (ask, advise, assist, arrange), this model was first proposed as a comprehensive set of guidelines for use by primary care clinicians to deliver consistent smoking cessation advice to patients. In 1994, the US Agency for Health Care Policy and Research (AHCPR) convened a panel of experts to provide clinical guidelines for treating addiction.<sup>7</sup> It was through these efforts that the 5As (ask, advise, assess, assist, arrange) were recommended as a set of evidence-based steps for effective tobacco cessation. The addition of the "Assess" step in the 5As model was intended to properly guide the subsequent cessation efforts (Assist and Arrange) for those patients willing to make a change. For the patients not yet willing to make a quit attempt, the guidelines suggested an additional motivational intervention. In 1998, the panel was reconvened and, through the support of numerous private and public institutions, updated its earlier synthesis of the existing scientific literature on smoking cessation and provided a revised version of the 5As approach.<sup>8</sup> The panel recommended the addition of the 5Rs (Relevance, Risks, Rewards, Roadblocks, and Repetition) as an interventional mnemonic to motivate patients assessed to be unwilling to make a quit attempt. Fiore et al<sup>8</sup> assert that, when utilized together, the 5As and 5Rs form an algorithm to guide consistent and appropriate cessation counseling for all smokers.

The 5As approach has also been applied to a growing range health behaviors and modified in a variety of ways. Pinto et al<sup>9</sup> deployed a 5As intervention to increase physical activity, and Jay et al<sup>10</sup> utilized the framework in the context of weight loss counseling. In the Step Test Exercise Prescription (STEP) trial, physician delivery of the 5As for increasing physical activity was associated with significant patient improvements in cardio-respiratory fitness.<sup>11</sup> Other studies have incorporated patient contributions to accomplishment of the 5As.<sup>12-13</sup>

### 1.2 Overview of the 5As Approach

#### 1.2.1 ASK

The ASK step suggested by Fiore et al<sup>8</sup> instructs clinicians to "identify and document tobacco use status for every patient at every visit." Identification of current smokers is necessary for any of the additional steps to take place. Analysis of recordings and transcripts reveals a number of ways in which this task is accomplished explicitly or manifests itself implicitly through the course of the conversation.

#### 1.2.2 ADVISE

After clinicians establish the smoking status of the patient, they are instructed to provide an unambiguous cessation message. Fiore et al<sup>8</sup> define the ADVISE step as urging "every tobacco user to quit...in a clear, strong, and personalized manner".

#### 1.2.3 ASSESS

The ASSESS step of the 5As approach is important insofar as it represents a crucial decision-making point for the remainder of the algorithm. The clinician is instructed to ASSESS the willingness of each smoker to make a quit attempt. Fiore et al<sup>8</sup> state that the clinician should "ask every tobacco user if he or she is willing to make a quit attempt at this time (eg, within the next 30 days)."

If the patient is ASSESSED to be ready, the clinician should proceed to the next task: ASSIST. If the patient is not ready, a brief motivational intervention (ie the 5Rs) is suggested and no further 5As tasks are to be pursued.

#### 1.2.4 ASSIST

"For the patient willing to make a quit attempt, use counseling and pharmacotherapy to help him or her quit".<sup>8</sup> Published guidelines recommend a number of possible components for ASSIST. First, the STAR model (Set a quit date, Tell family, friends, and coworkers about quitting, Anticipate challenges, Remove all tobacco products from environment) is offered as an overall plan for patient action around quitting. Additionally, clinicians are instructed to: (1) Provide practical counseling including problem-solving training, (2) Provide intra-treatment social support, (3) Help the patient obtain extra-treatment social support, (4) Recommend the use of approved pharmacotherapy, except in special circumstances, (5) Provide supplementary materials.<sup>8</sup>

#### 1.2.5 ARRANGE

An important aspect of the 5As includes a call for clinicians to arrange follow-up with each patient to help support their continuing cessation efforts. This task consists of the clinician acting to "schedule follow-up contact, preferably within the first week after the quit date."<sup>8</sup> The guidelines recommend contact be made either in person or by phone. Additional follow-up should be scheduled within the first month, with ongoing follow-up contact as needed.

### 2.0 THE 5As DIRECT OBSERVATION CODE FOR PHYSICAL ACTIVITY

#### 2.1 Background – The Need for an Instrument

The delivery of the 5As in routine medical care has been examined primarily through retrospective chart review,<sup>14</sup> patient survey,<sup>15</sup> and system-level health provider data,<sup>16</sup> but each of these methods is vulnerable to biases and inaccuracies.<sup>17</sup> Direct observation methods involving audio or video recording of the interaction have been identified as the reference standard.<sup>18</sup> Although the 5As have traditionally been conceived of as a physician-focused framework for communication, recent studies have suggested that patient engagement in discussion of physical activity may contribute to supporting initiation and maintenance of behavior change,<sup>19</sup> and that patients do contribute to accomplishing the 5As by specifying a realistic goal and action plan for change, problem-solving about anticipated challenges, and identifying strategies for support.<sup>12</sup> Our coding scheme for applying the 5As to physical activity was developed as a new means to assess physical activity discussion using directly observed, audio-recorded data and which incorporated both patient and physician participation.

#### 2.2 Development

The 5As Direct Observation Code for Physical Activity was developed by researchers in the Department of Family Medicine, Research Division at Case Western Reserve University in Cleveland, Ohio. This coding scheme fills an important gap in the current research into the delivery and efficacy of physical activity counseling by providing a valid, reliable instrument by which the 5As can be identified and evaluated. Additionally, this coding scheme offers the flexibility necessary to document the ways in which the individual tasks of the 5As (Ask, Advise, Assess, Assist, Arrange) are accomplished by both patients and clinicians. The initial steps for developing the coding scheme involved reviewing published definitions of the 5As<sup>2</sup> and examining prior direct-observation measures of the 5As<sup>12,20-21</sup> to refine definitions and coding rules suitable for audio-recorded discussions of physical activity. We used our preliminary template to code an initial sample of 10 audio-recorded discussions of physical activity between patients and primary care physicians. These 10 cases were discussed and the coding scheme was further refined with 2 more sets of 5 cases reviewed and discussed. During this iterative process, we selected physical activity examples for each of the 5As to illustrate and operationalize the coding scheme.

During the development phase, a few other features of the physical activity talk were also noted as potentially important: patient expression of willingness, unwillingness, or ambivalence to change, and talk involving

problem-solving, exploration of social supports or other resources for change. Codes for these variables were developed using a similar process as described above. The category of Ambivalent was defined as patient expression of neither willingness nor unwillingness to improve his/her physical activity status, but rather a conflicted or uncertainty about changing physical activity.

Next, we applied coding scheme to a sample of audio-recorded office visits. A total of 361 patients reported in the pre-visit survey they did not meet the recommended level of physical activity (at least 30 minutes of moderate activity 5 days a week).<sup>22,23</sup> Physical activity was discussed in 139 of these cases. From this group (n = 139), we chose a random subsample of 21 physical activity discussions (separate from the phase 1 sample) which were coded by 2 raters to generate a Kappa as a measure of interrater agreement for each 'A'. The kappa's were in the very good to excellent range, Ask - 1.0, Assess - .62, Advise - .81, Assist - .72, and Arrange - 1.0. We found that Assess was the least straightforward and therefore the most challenging to document. This is in part due to the indirect way that physicians elicit patient's willingness to change and the often vague way in which patients responded. Thus, it was the most challenging A to code and had the lowest interrater reliability. Using our preliminary template, we randomly selected 20 audio-recorded visits from the pool of 28 physicians and 139 patients with visits known to contain some discussion of physical activity.

### 2.3 Coding Process

This coding scheme is designed to be used with audio-recordings of clinician-patient encounters. It tracks the key tasks outlined in the 5As model by (1) noting the presence or absence of any task accomplished, and (2) identifying which participant in the encounter first accomplished the task. Additionally described are codes for (1) physically active or inactive in response to Ask, (2) willing to change, unwilling to change and ambivalent about change in response to Assess, (3) barriers to improving physical activity status, and (4) mention of the recommended levels of exercise (30 minutes, 5 days a week).

#### ASK - Identification of Current Behaviors Related to Physical Fitness

**Ask-Physician** Any talk by the physician that seeks to establish the patient's current physical activity status.

##### EXAMPLES

1. MD: Do you tend to get out and do some walking and stuff like that then?
2. MD: And could you tell me, what type of exercise do you do?

Physician-initiated physical activity discussion may elicit certain responses. These responses help determine the appropriateness of proceeding with 5As assessment.

**Ask Response-Active** The patient responds in the affirmative when asked if s/he currently exercises. The patient gives a clear indication of being physically active to any extent.

##### EXAMPLES

1. PT: I walk the dogs regularly. It's not enough to get my heart rate up because, you know, they stop and sniff.
2. MD: Well are you able to change anything, or are you still, you know, busy with baby and everything?

PT: Um, I'm still nursing him. But I am getting an elliptical.

**Ask Response-Inactive** The patient responds in the negative when asked if s/he currently exercises. This code is also used when, rather than responding in the affirmative or the negative, the patient evades the question. By not directly answering, it is inferred that the patient is currently inactive. Further, this code is used when the patient's response to the physician's question refers only to the future—it is inferred that the patient is currently inactive.

EXAMPLES

1. PT: Now I don't exercise and I have gained a lot of weight.

2. PT: Well not really but I'm gonna try to start.

**Ask Response-Unclear** It is unclear, given the context, whether the patient is currently physically active or not.

EXAMPLES:

1. MD: And if we do this, I want you to understand that you need to be exercising and taking your calcium and we need to monitor you.

PT: Well that's what I'm doing. I mean that's what I'm looking forward to.

**Ask-Patient** The patient initiates the topic of his/her current physical activity. The patient reports activities related to physical fitness or exercise change or management. May include reports of not currently exercising.

EXAMPLES

1. PT: Now I don't exercise and I have gained a lot of weight. (unprompted by physician)

2. PT: I go to the gym several times a week. (unprompted by physician)

**ADVISE – Recommendation to begin or improve physical activity**

**Advise-Physician** The physician attempts to persuade the patient into changing or improving his/her physical activity status. Physician may clearly recommend that the patient engage in physical activity by giving direct advice. Alternatively, the physician may advise more implicitly by engaging in a discussion of the benefits or exercising, of the risks of inactivity. The physician's advice may be personalized and specific to the patient's needs.

EXAMPLES:

1. MD: There's bad and there's good kind of cholesterol. You ever heard that before?

PT: Um-hmm.

MD: So your bad was up just a little bit.

PT: Okay.

MD: So you can change your diet and start exercising.

2. MD: But the biggest thing I worry about is bone density.

PT: Okay.

MD: And if we do this, I want you to understand that you need to be exercising and taking your calcium and we need to monitor you.

**Advise-Patient** The patient initiates discussion regarding the need to become physically active or to improve regularity and/or intensity of activities. Patient may also offer his/her own reasons for why physical activity change is needed.

EXAMPLES:

1. PT: Um so that's because it's clear to me that I need more of that moderate exercise, increasing your heart rate.

2. PT: The wife, she's delivering the 2nd of September, so um I'm planning on exercising a lot more so I'll be able to uh get around and uh with this young fellow that we're expecting.

### **ASSESS – Assessment of Willingness or Readiness to Improve Physical Activity Status**

**Assess-Physician** The physician determines the patient's readiness to change his/her physical activity status, to begin regular exercise, or to increase physical activity level. The physician may obtain a response regarding the patient's readiness to change through direct inquiry, or through the patient's reaction to "ask" or "advice" from physician.

#### EXAMPLES:

1. PT: Yeah. Pool's opening up today.

MD: So what do you think? I mean do you think that uh will make a big difference as far as the amount that you exercise?

PT: Oh yeah. Yeah. I usually get in there like for three or four times a week and get a least an hour exercise.

2. MD: Is that something that you might be interested in doing?

**Assess-Response-Willing** The patient is willing to change his/her physical activity status at this time.

#### EXAMPLES:

1. PT: I do not. But I'm planning to join the gym this week.

2. PT: I'd like to um do something I haven't been doing for the last few months, but I'm going to start again March 1st. And that's exercising in the water.

**Assess-Response-Ambivalent** The patient responds with ambivalence about willingness to change his/her activity status, using words/phrases like "I should" and "I'd like to but...", etc.

#### EXAMPLES:

1. PT: I know I need to. It's just so hard working night shift, working the 12 hours, then driving up to Cleveland... By the time I get home, all I want to do is climb in the bed, you know? And so I sleep 'til 5 or 6:00, and from 6:00 to 10:00 is such a short window to do anything. It's just tough for me.

2. PT: I says, Well I'm at a Catch-22, 'cause I, you know, I mean I don't feel like exercising. I want to.

**Assess-Response-Unwilling** The patient is unwilling to change his/her physical activity status.

#### EXAMPLES:

1. PT: I just, I, I don't have the energy. It seems that I don't have the energy to do it, and I don't have...I, I put the strength, you know, not having the strength to do it.

2. MD: Do you tend to get out and do some walking and stuff like that then, or...?

PT: I will. Uh, it seems like I don't make time for it or something.

**Assess-Response -Unclear** It is uncertain whether the patient is willing to make changes to his/her physical activity status.

#### EXAMPLES:

1. PT: between the day at work and getting the dogs out for a stroll. Probably the thing to do is get up a half an hour earlier and get on the exercise bike.

MD: Is that real? That can happen?

PT: Well that's what should happen...

MD: <laughter>

PT: <laughter> as opposed to trying to do it at 8:00 at night.

**Assess-Patient** The patient may also introduce the topic of his/her readiness and/or willingness to change his/her physical activity status.

EXAMPLES:

1. PT: I have to try to figure out a way to make myself do the exercise. I need to do.
2. PT: I'm going to start exercising more.

**ASSIST – Assistance With a Concrete Strategy to Improve Physical Activity Status and/or Address Barriers**

**Assist-Physician** The physician offers a concrete strategy, support, referral, or other resources to help patient change and/or improve physical activity status. This may be a problem solving approach to address barriers (eg, personal behaviors, social support, and knowledge of available resources) preventing patient from being physically active. Discussions may lead to strategizing and goal setting to help patient improve his/her activity level.

EXAMPLES:

1. MD: Start walking, you know. Start walking around the track or just walking around a little bit, and slowly build it up, and pretty soon you going to find yourself jogging.
2. MD: Do you have a backpack?

PT: No.

MD: You should get a backpack carrier, because you know what? You could wear them. Try the machine out, and if you feel pretty coordinated on it, throw (the baby) in the backpack and get on the elliptical. They love it.

PT: Okay. Really?

MD: It'll put him right to sleep.

PT: Okay.

MD: Plus it makes your workout harder. <laughter>

**Assist-Patient** The patient volunteers specific plans or goals to change his/her physical activity status. This includes any concrete plans, such as "I'm going to start walking with my husband".

EXAMPLES:

1. PT: Yeah, and I think I'm gonna talk to some, one of the personal trainers or something over there, too, just to get some weight bearing stuff....
2. Okay, And um I want you to tell me, if you can, when you think I should be able to do some type of exercise and what kind, walking or the bike, or treadmill, or what do you think?

**ARRANGE – Follow-up to Help Support the Patient’s Continuing Efforts at Improving Physical Activity Status**

**Arrange-Physician** The physician sets up a method of follow-up, such as a phone call or a visit, to track the patient’s progress.

EXAMPLES:

1. PT: That’s good. what I’m doing, and it’ll be my logic. And is it within three months again, or?

MD: Yeah. And we’ll see how we’re doing with the exercising, if you don’t mind. End of August or, or beginning of uh September.

PT: September, okay.

2. MD: I would, uh, see you about a month after you’ve started on your elliptical.

**Arrange-Patient** The patient offers to report updates of his/her physical activity progress to the physician.

< NO EXAMPLES >

**BARRIERS – Discussion of real or potential barriers to the patient’s physical activity behavior.**

EXAMPLES:

1. MD: I want you to start exercising. Okay?

PT: Yeah, I um, I tried to join, you know, Curves.

MD: Um-hmm.

PT: But they wanted so much money.

2. PT: And then so that’s what happens when I get home at the end of the day and take care of them. So after, you know, it’s not an excuse. Well it, I am using it as an excuse, but it’s not a good one. So I take care of (the dogs), and then I’m pretty much toast between the day at work and getting the dogs out for a stroll.

**RLE – Recommended Level of Exercise.** This code is used when the specific, recommended levels of exercise (30 minutes, 5 days a week) are mentioned/discussed – by either patient or physician.

EXAMPLES:

1. MD: So your exercise prescription is to work out to 30 minutes 5 days a week.

2. MD: What I don’t want to do ‘cause you’re so young, I don’t want to start layering on all kinds of medicines. So this is what I’m requesting, that you start exercising regularly, or really I just want you walking 30 minute a day 5 days a week. Seems like a lot, but maybe when the kids are in school.



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