Table 1
Cases of secondary IPA according to origin ($N = 109$).

Skeletal		
	Vertebral osteomyelitis	29 (26.6%)
	Epidural abscess	6 (5.5%)
	Septic arthritis	5 (4.6%)
	Post arthroscopy infection	2 (1.8%)
	Femoral osteomyelitis	2 (1.8%)
	Infected lumbar fusion	2 (1.8%)
	Infectious sacroiliitis	1 (0.9%)
Gastrointestinal		
	Diverticulitis	6 (5.5%)
	Pancreatic abscess	4 (3.7%)
	Crohn disease	5 (4.6%)
	Abdominal abscess	4 (3.7%)
	C. difficile colitis	3 (2.8%)
	Appendicitis	2 (1.8%)
	Colorectal cancer	2 (1.8%)
	Ulcerative colitis	1 (0.9%)
	Rectal abscess	1 (0.9%)
Cardiovascular		
	Infected vascular graft	6 (5.5%)
	Infected catheter	5 (4.6%)
	Endocarditis	3 (2.8%)
	Infected Fistula	1 (0.9%)
Bacteremia/sepsis		10 (9.2%)
Urinary		
	Urinary tract infection	1 (0.9%)
	Pyelonephritis	3 (2.8%)
Other		5 (4.6%)

with broad-spectrum antibiotics, followed by percutaneous drainage (68%) and/or surgical decompression (13%). Patients spent an average of 13.5 ± 11.3 days in the hospital; the mortality rate was 2.3% (3 patients).

Iliopsoas abscess is a relatively uncommon condition that often presents with ambiguous clinical features. Patients may initially present with nonspecific symptoms such as malaise, fatigue, and low-grade fever, or they may exhibit a more severe presentation such as high fever, weight loss, pain in the abdomen, groin, low back, or hip, or difficulty walking [1]. We found, as has been shown previously, the classic triad of pain, fever and limp is rarely seen in IPA patients [3]. CT has been documented as having a diagnostic sensitivity rate for IPA approaching 100% and this method was used to confirm diagnosis in 71% of our patients [3]. Mortality rates of approximately 2.4% for primary, and up to 18.9% in secondary IPA have been documented [4]. Our study had an overall mortality rate of 2.3%. Difficulty of making the correct diagnosis can be attributed to its non-specific presentation as well as its rarity. However, a thorough medical history and subsequent imaging studies can be helpful in establishing the diagnosis and making effective therapy possible.

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Barriers to bystander CPR: Evaluating socio-economic and cultural factors influencing students attending community CPR training

Out-of-hospital cardiac arrest (OHCA) remains a leading cause of death in the United States, affecting over 350,000 people annually [1]. Research repeatedly demonstrates that prompt bystander initiated cardiopulmonary resuscitation (CPR) improves both the overall survival rate and nearly every objective measures of surviving an OHCA [2-9]. Yet the rate at which bystander initiated CPR is administered varies considerably and is dependent on the location of the arrest [6,10-14]. With the overwhelming evidence in support of bystander CPR, public health organizations have implemented widespread educational initiatives to train laypeople in compression-only CPR over the past decade. Correspondingly, an increase in the proportion of patients receiving bystander CPR in large national registries has been reported [5,15,16]. Despite overall increases in bystander rates, specific populations such as the socio-economically disadvantaged and the under-educated, still lag behind in this critical link in the chain of survival [17,18]. Several barriers to bystander intervention have been identified in recent years including panic, general anxiety, fear of not performing CPR properly, fear of hurting the victim, fear of litigation, and fear of transmittable diseases [2,19,20]. The purpose of this study is to identify how social and educational factors impact reported barriers to bystander CPR.

Prospective surveys were conducted both before and after free community compression-only CPR classes in Howard County, Maryland during a three-month study period. Requested information included demographics, previous CPR training, motivation for learning CPR, followed by four questions that asked the respondent to rank his/her confidence and likelihood in performing CPR, as well as barriers to performing CPR (using a visual analog score). A validated pilot-tested survey was administered to all members in attendance at all CPR training classes excluding classes at mass gatherings and classes targeting children under 14.

Table 1
CPR training participant demographics (continuous).

	Mean (SD)	Range
Age	47.5 (16.1)	14–81
Median zip code annual household income (IQR)	$100,252 ($91,276–$108,169)	$33,772–$161,447
Number of children	1.5 (1.4)	0–6
Number of people in household	3.2 (1.6)	1–8

Surveys were distributed at 32 classes with a total of 300 individuals receiving the survey. Univariate analyses were performed for analysis of central tendency and distribution of the variables. Bivariate analyses were performed looking at sociodemographic and prior CPR experience variables by barriers, motivation for learning, and likelihood of performing CPR. Responses to the barrier and motivation questions were not normally distributed, so medians and interquartile range (IQR) were reported and non-parametric tests of significance were performed (Wilcoxon).

Among the 267 respondents, the mean age was 47.5 years, 57% were female, and median household income was $100,252, as reported by

Table 2
CPR training participants demographics (categorical).

	Breakdown	
Gender	57.0% (n = 135) female	
	43.0% (n = 102) male	
Age (years)	14–18: 5.0% (n = 12)	
	19–25: 6.3% (n = 15)	
	26–40: 21.4% (n = 51)	
	41–60: 44.1% (n = 105)	
	61+: 23.1% (n = 55)	
Median annual household income of zip code	Less than $49,999: 5.9% (n = 14)	
	$50,000–$94, 999: 19.5% (n = 60)	
	$95,000+: 74.6% (n = 176)	
Number of children	Zero: 33.6% (n = 80)	
	One or more: 66.4% (n = 158)	
Number of people in household	One: 10.6% (n = 25)	
	Two or more: 89.4% (n = 211)	
Race/ethnicity	White: 71.1% (n = 160)	
	Asian/Pacific Islander: 8.0% (n = 18)	
	Black/African American: 16.0% (n = 36)	
	Hispanic/Latino: 3.1% (n = 7)	
	Native American: 0.8% (n = 2)	
	Other: 4.0% (n = 9	
Education	No college: 28.5% (n = 67)	Some high school: 5.5% (n = 13)
		High school graduate/GED: 17.0% (n = 40)
		Trade/technical school: 3.0% (n = 7)
		Other: 3.0% (n = 7)
	College or higher: 71.5% (n = 168)	Some college: 16.6% (n = 39)
		College graduate: 54.9% (n = 129)

Table 3
Pre test.

Socio-economic factor	Likelihood of performing CPR*		Barriers to performing CPR†			
	Stranger	Family member	Fear of being sued	Risk of disease	Fear about hurting someone if doing CPR unnecessarily	Fear about hurting someone if doing CPR incorrectly
Gender‡	0.32	***0.022***	0.30	0.19	0.55	0.23
M	5.5	*10.0*	5.0	5.0	5.0	5.0
F	5.0	*8.0*	4.0	4.0	5.0	6.0
Age‡	0.32	0.25	**0.04**	**0.06**	0.09	0.15
14–18	2.0	5.0	5.0	6.0	6.0	8.0
19–25	6.5	10.0	1.0	2.0	3.0	5.0
26–40	5.0	8.0	5.0	5.0	5.0	6.0
41–60	6.0	10.0	5.0	5.0	5.0	6.0
61+	5.5	8.0	3.0	3.0	5.0	5.0
Median annual household income	0.078	0.689	0.641	0.478	0.271	0.129
<$49,999	8.0	10.0	4.5	4.0	4.0	4.0
$50,000–$94,999	5.0	9.0	4.0	5.0	5.0	6.0
>$95,000	5.0	9.0	5.0	5.0	5.0	5.0
Children	0.821	0.562	0.439	0.368	0.680	0.660
Yes	5.0	10.0	5.0	5.0	5.0	5.0
No	5.5	8.0	4.0	4.0	5.0	6.0
Others in household	0.040	0.204	0.185	0.900	0.400	0.809
Yes	6.0	10.0	5.0	5.0	5.0	5.0
No	5.0	8.0	3.0	3.0	5.0	5.0
Race/Ethnicity	0.361	0.254	0.107	0.666	0.878	0.218
White	5.0	9.5	4.0	4.5	5.0	5.0
Asian/Pacific Islander	4.5	5.0	6.5	5.5	5.5	8.0
Black/AA	5.0	8.0	3.0	4.0	5.5	6.0
Hispanic/Latino	9.0	9.0	4.0	5.0	6.0	6.0
Other	6.0	10.0	7.0	4.0	5.0	5.0
Multiple	6.0	6.0	5.0	4.0	6.0	8.0
Education	0.220	0.940	**0.022**	**0.006**	0.135	0.102
No college	5.0	10.0	5.0	5.0	5.0	6.0
College+	6.0	10.0	4.0	4.0	5.0	5.0

*Reported on a 10-point Likert scale with 1 corresponding to "Not likely" and 10 corresponding to "Very likely". Reported on a 10-point Likert scale with 1 corresponding to "Not confident" and 10 corresponding to "Very confident". First reported value represents the *p*-value. Statistically significant *p*-values are shown in **bold italics**.

home zip-code (Table 1). Seventy-one percent reported a college education or higher (Table 2). In pre-training responses, males reported a higher median likelihood of doing CPR on both strangers (median = 5.5 (IQR = 4–8)) and family members (median = 10.0 (IQR = 7–10)) compared to females (median = 5.0 (IQR = 2–8), $p = 0.32$; median = 8.0 (IQR = 4–10), $p = 0.022$, respectively) (Table 3). However, in post-training responses, there was no statistically significant difference (Table 4).

In pre-training responses participants with no college education reported higher likelihood of all four barriers to limit the delivery of bystander-CPR. In post-training responses lack of college education still increased the reported likelihood of all four barriers to prevent bystander CPR with $p = 0.007$ (no college median = 1 (IQR = 1–5) versus college median = 1 (IQR = 1–2)) for fear of litigation, $p = 0.037$ (no college median = 1 (IQR = 1–3) versus college median = 1 (IQR = 1–2)) for risk of disease, $p = 0.004$ (no college median = 2 (IQR = 1–5) versus college median = 1 (IQR = 1–3)) for fear of performing unnecessary CPR, and $p = 0.013$ (no college median = 2 (IQR = 1–5) versus college median = 1 (IQR = 1–3)) and for fear of doing CPR incorrectly (Table 5).

In the present analysis, women were found to report lower likelihood of performing CPR in pre-training responses. Although this disparity was alleviated in post-training responses, the pre-training difference could indicate need for increased outreach to women. Individuals who had not attended college reported fear of lawsuit and disease transmission as more likely to prevent bystander CPR, and this barrier was not alleviated with the current training regimen. This finding is in line with previous literature that notes low socioeconomic status and the lack of a college level education to be associated with lower rates of bystander CPR [11,12,21]. A more targeted curricular modification addressing medico-legal and infectious disease concerns is needed. In addition, low dose, high frequency CPR training has been shown to improve CPR performance and may be an effective way to inspire confidence and support a culture of action regarding bystander CPR while maintaining a state of readiness [22].

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