STUDY OBJECTIVES

- Patients with pulmonary arterial hypertension (PAH) are often not appropriately assessed and treated.
- This study was conducted to determine if an online, simulation-based continuing medical education (CME) intervention could improve performance of pulmonologists and cardiologists in the management of patients with PAH.

METHODS

- The CME intervention consisted of 2 cases presented in a virtual patient simulation (VPS) platform that allowed learners to order laboratory tests, make diagnoses, and recommend treatments from a range of options matching the scope and depth of actual practice (Figure 3).
- The clinical decisions made by the learners in open-field responses similar to electronic health records were analyzed using an artificial intelligence engine, and clinical guidance (CG) was then provided based on current evidence, guidelines and expert recommendations.
- Learner decisions were collected after CG and compared with each user's baseline pre-CG decisions using a z-score, paired t-test. P-values were determined to assess significance of changes seen as a result of participating in the education.
- An overview of the cases is provided in Figure 1.
- The activity launched on July 28, 2016, and data were collected through September 1, 2016.

RESULTS

Significant improvements were observed after clinical guidance, related to patient assessment (Figure 2).

Case 1: Pulmonologists (n=103 cardiologists)
- 16% absolute improvement among pulmonologists (77% pre-CG vs 93% post-CG; P<0.001) and 16% improvement among cardiologists (61% vs 77%; P=0.002) in orders for right heart catheterization.
- 20% improvement among pulmonologists (65% vs 77%; P=0.002) and 11% improvement among cardiologists (53% vs 64%; P=0.001) in ability to diagnose PAH type.
- 12% improvement among pulmonologists (82% vs 70%; P=0.001) and 33% improvement among cardiologists (48% vs 61%; P=0.001) in ability to diagnose PAH type.
- 17% improvement among cardiologists (54% vs 77%; P=0.001) and 25% improvement among pulmonologists (40% vs 63%; P=0.001) in ability to order ventilation/perfusion scanning.
- 14% improvement among pulmonologists (63% vs 59%; P=0.002) and 11% improvement among cardiologists (58% vs 72%; P=0.001) in order for initial PAH therapy based on patient characteristics.

Case 2: Pulmonologists (n=96 cardiologists)
- 19% absolute improvement among cardiologists (61% vs 80%; P<0.001) and 53% in ability to diagnose PAH type.
- 21% improvement among cardiologists (72% vs 93%; P<0.001) and 12% improvement among pulmonologists (60% vs 72%; P=0.001) in ability to diagnose PAH type.
- 14% improvement among cardiologists (22% vs 67%; P<0.001) and 25% improvement among pulmonologists (24% vs 46%; P=0.002) in ability to order ventilation/perfusion scanning.
- 11% improvement among cardiologists (50% vs 64%; P=0.001) and 25% improvement among pulmonologists (45% vs 70%; P=0.001) in ability to diagnose PAH type.

CONCLUSIONS

- This study demonstrates that VPS, which immerses and engage the specialists for an authentic and practical learning experience, can improve evidence-based clinical decisions of specialists related to the management of PAH.
- This assessment also suggests that additional education is warranted on appropriate patient assessment to characterize patients with PAH, diagnostic testing, tailoring therapy, and use of patient-centered management approaches to improve care.

Clinical implications

Using VPS-based CME to improve performance of pulmonologists and cardiologists has the potential to translate into improvements in clinical care and patient outcomes.

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References


FIGURE 1: Overview of Patient Cases

Case 1: Cardiologist A
- “This is a very poor job, and likely not very difficult for someone in their field.”

Case 2: Cardiologist B
- “The info being thrown at us was very overwhelming. I really wish I could have taken a refresher course or watched the webinar. My recent education in cardiology was only a couple of years ago.”

FIGURE 2: Clinical Decisions Related to Diagnosis and Tailoring Therapy for PAH

Significant improvements were observed after CG, related to the diagnosis and tailoring therapy for PAH (Figure 3).

Case 1: Pulmonologists (n=103 cardiologists)
- 16% improvement among pulmonologists (77% pre-CG vs 93% post-CG; P<0.001) and 16% improvement among cardiologists (61% vs 77%; P=0.002) in ability to diagnose PAH type.
- 20% improvement among pulmonologists (65% vs 77%; P=0.002) and 11% improvement among cardiologists (53% vs 64%; P=0.001) in ability to order ventilation/perfusion scanning.
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- 11% improvement among cardiologists (50% vs 64%; P=0.001) and 25% improvement among pulmonologists (45% vs 70%; P=0.001) in ability to diagnose PAH type.

FIGURE 3: Clinical Decisions Related to Diagnosis

Significant improvements were observed after CG, related to the use of patient-centered care in PAH (Figure 4).

Case 2: Pulmonologists (n=103 cardiologists)
- 16% absolute improvement among pulmonologists (77% pre-CG vs 93% post-CG; P<0.001) and 16% improvement among cardiologists (61% vs 77%; P=0.002) in ability to order ventilation/perfusion scanning.
- 14% improvement among pulmonologists (63% vs 59%; P=0.002) and 11% improvement among cardiologists (58% vs 72%; P=0.001) in ability to diagnose PAH type.
- 17% improvement among cardiologists (54% vs 77%; P=0.001) and 25% improvement among pulmonologists (40% vs 63%; P=0.001) in ability to order ventilation/perfusion scanning.
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