residents with a high compliance rate for the reporting itself, but clear discrepancies in the number of hours reported. Although this data is reported from a single institution over a 4 month period, it seems unlikely that significant differences in the accuracy of self-reported data would be found at other institutions. On a reassuring note, weekly house staff hours for both residents and interns in Internal Medicine at TAMC were both well below the mandated standard when averaged over 4 months.

Studies are needed to determine the most accurate way of assessing house staff work hours to produce data of sufficient quality on which to base legislation and regulatory decisions. However, it is has yet to be established that an 80 hour work week by medical house staff will lead to a reduction in diagnostic and treatment-related errors or improved patient outcomes. In fact, recent data from an academic medical center found no relationship between prescribing errors and resident work hours. Early reports from the media and academic sources indicate that the restrictions have been difficult to implement with 92 citations for work hours violations issued to 1,753 residency programs reviewed by ACGME in the first year. Questions have also been raised regarding the potential negative impact of restrictions on the quality of GME training programs, and the continuity of patient care and safety. Raw work-hour numbers do not provide any indication of the amount of time spent in actual diagnostic and treatment decisions versus administrative tasks, the actual amount of responsibility delegated to that individual for a given treatment decision by a particular supervising physician, the degree of supervision provided while doing invasive procedures, the number of patients that the resident was responsible for at a given time, the amount of sleep that the individual got on call, or the acuity and volume of patients admitted or treated on cross-cover duties. These and other factors introduce a great deal of variability and complexity into the larger task of improving patient safety which recent legislation has attempted to address.

**Conclusions**

In comparing the two methods of self reporting work hours, we found little internal consistency between daily and monthly self-reported work hours. Self reported work hours vary considerably depending on the method of collection. Compliance policy for the 80 hour work week should be based on reliable and consistent strategies to collect work hours. Such methods have yet to be defined. ACGME program requirements and legal mandates demand urgent validation of standardized data collection methods. Monthly self-reporting appears on average to inflate actual hours worked by over 20% (up to 12 hours per week on average) compared with a daily assessment in our program. Daily reporting was cumbersome, and compliance was only 86% for participating residents. This experience reinforces a need to accurately collect work hour data so we can structure learning experiences efficiently and effectively.

There are important incentives which introduce biases in self-reported work hour data. Residents may feel that they are overworked and may inflate their hours to bring about changes in scheduling policies. Conversely, aware that program accreditation now rests in part on newly implemented work-hour standards, they may underreport data to prevent their program from being sanctioned by regulatory agencies. Finally, depending on the frequency of data collection (eg. monthly, weekly, daily) - residents may simply have difficulty actually recalling the exact hours that they worked, and may see the recently intensifying efforts at data collection as simply another administrative task to be dispensed with expeditiously. The biases are problematic for legislation and regulatory compliance decisions based on self-reported data. This study points out the inherent problems among a group of motivated residents.
pectopy. He had no chest pain. At the completion of this treatment, he had improvement of the quadranopsia and right arm weakness but still was incomplete. He was returned to the ward and within the next 24 hours, the EKG changes spontaneously remitted. On that day (day 3), his CPK was 981, MB 15, MB12, and Troponin I 1.6. He was retreated once again for persistent right quadranopsia and right arm weakness at 60 fsw on 100% oxygen. At the completion of this treatment, he had complete resolution of the quadranopsia and right arm weakness. On the following day, his EKG remained normal, he had no chest pain, his labs showed a CPK of 701, MB 5, MB1, and Troponin I 0.5. No additional recompression treatments were undertaken. Within the next twenty-four hours, he had an echocardiogram which demonstrated an ejection fraction of 76% and no ASD/PFO; gated myocardial perfusion imaging at rest and with exercise which was completely normal; an exercise treadmill test which ran for 11 minutes and 19 seconds to 95% of predicted, with a few PACs, and no ischemic changes; a brain MRI which showed densities in the ACA-MCA region, and a brain MRA which showed no hemodynamic stenosis. He was subsequently discharged from further care and advised to refrain from diving for a minimum of six weeks.

Discussion
Over the past twenty years, the HTC has treated over 100 cases of arterial gas embolism with tourist divers being affected at twice the rate of Hawaii residents. In the setting of diving, breath holding while breathing compressed gas and ascending in the water column is the inciting action which leads to over-inflation of the lungs according to Boyle’s Law. This situation usually occurs as a result of panic developing in an “out of air” emergency or with buoyancy control problems. Arterial gas embolism most commonly results from pulmonary barotrauma where the breathing gas gains direct access to the pulmonary vasculature and is transported to the brain. Cases of suspected coronary embolization have also been reported. Symptoms develop during or immediately after surfacing. The history and physical findings in this case presentation leave no question as to the diagnosis of cerebral arterial gas embolism. Given the apparent rarity of coronary arterial gas embolization, the question in this case was whether there was a concomitant embolic event involving a coronary artery. Cardiac dysrhythmias and CPK elevations, including MB fraction, have been associated with cerebral emboli alone without any cardiac manifestations. It may be possible that the bubbles entering the cerebral circulation initiate hyperactivity of the autonomic nervous system resulting in cardiovascular dysfunction. Troponin I, however, is quite cardiac-specific for myocardial damage and the EKG changes in this case are more ischemic in nature. Thus direct cardiac injury did occur during this event. The question then arises: did this patient have some pre-existent coronary artery disease which under the stress of this emergency manifested itself? The nuclear imaging studies did not show any perfusion deficits, nor were there any ischemic changes induced while on the treadmill. The transient rise in his cardiac enzymes remained somewhat low and dissipated rapidly and coincidentally with his treatment and speedy recovery. These findings, in addition to his level of fitness and lack of pre-existing cardiac risk factors would tend to support a diagnosis of concomitant cerebral and coronary arterial gas emboli.

The definitive treatment for arterial gas embolism is recompression to reduce the size of the offending bubbles and to deliver hyperbaric oxygen to those tissues that are hypoxic and in danger of cellular death. In this case, the patient was initially treated at 160 fsw using a gas mixture designed to limit any additional nitrogen uptake while providing 2.9 atmospheres absolute (atm abs) of oxygen to the tissues. Follow-up treatments were conducted at 60 fsw on 100% oxygen which provides 2.8 atm abs of oxygen.

Conclusion
This sport diver suffered concomitant cerebral and coronary gas emboli. He was treated successfully and made a complete recovery without any residual symptoms. This is the first case to be so reported.

References