


LETTER TO THE EDITORS

The Affordable Care Act and access to extracorporeal membrane oxygenation as a bridge to lung transplantation in Medicaid recipients

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Lung transplantation (LT) is the definitive therapy for end-stage lung disease [1]. The Affordable Care Act of 2010 sought to increase access to medical care and decrease the number of uninsured Americans [2]. The expansion of Medicaid required states to provide health care to adults whose income was up to 138% of the federal poverty level [3]. The majority of states adopted the expansion, some immediately and others in a delayed fashion and overall, there was an increase in access to medical care and a decrease in the number of the uninsured [2]. In this report, we examined the association between the timing of implementation of Medicaid expansion (ME) and variation in access to extracorporeal membrane oxygenation (ECMO) as a bridge to LT. To accomplish this, we used Scientific Registry of Transplant Recipient (SRTR) data pertaining to candidates aged 18–64 years. Variations in ME were evaluated by comparing those candidates listed in 2011–2013 (pre-ACA expansion) to those listed in 2014–2016 (post-ACA expansion). Additionally, we compared LT listings in states that adopted ME in 2014 versus those that did not. The sample comprised candidates who received ECMO at time of listing or of transplantation. A total of 9153 candidates met inclusion criteria. LT candidates on Medicaid increased post- ME (8.3–9.9%, $P = 0.006$). Use of ECMO increased 67.1% in the post-ME era (3.8–6.3%, $P < 0.001$). LT listings requiring ECMO increased significantly in ME states (4.7–6.7%, $P = 0.003$) and in nonexpansion states (2.6–5.8%, $P < 0.001$). LT candidates requiring ECMO increased significantly post-ME in both Medicaid (4–8%, $P = 0.016$) and (4–6%, $P < 0.001$) non-Medicaid cohorts.

Access to ECMO is particularly relevant in candidates whose bridging needs exceed the capability of

conventional support. Medicaid patients tend to be sicker at the time of transplantation and their hospitalizations are frequently associated with lower survival, longer LOS and higher charges [4]. The use of ECMO is a costly endeavour with daily charges exceeding \$20 000 [5]. The perceived cost of care and possibility of lower reimbursement may influence perceptions regarding candidacy of Medicaid recipients and the attendant financial hurdles may further detract from successful wait-listing, leaving limited options in the face of end-stage lung disease. Obtaining coverage is often left to the discretion of individual state legislators to decide extent of Medicaid coverage for vulnerable populations, particularly females, non-Caucasians and those living in rural states [6]. The coverage varies by state. New York, for example, derived a Medicaid budget of \$60 billion from taxes collected at the county level, providing one of the most comprehensive benefits in the country that expanded access and reduced uncompensated costs [7].

In ME states, uncompensated care costs decreased from 3.9% of operating costs in 2013 to 2.3% in 2015 [8]. These savings totalled \$6.2 billion. These findings were complemented with a mean \$3.2 million increase in Medicaid revenue per hospital in the same states following the reduction in uncompensated costs attributed to the uninsured and a corresponding increase in revenue from the newly insured [9]. Alternatives to ME have been explored in states such as Arkansas, who opted out of Medicaid expansion to gain federal funding, providing cost assistance to private health insurance services. Similar outcomes, defined as decline in uninsured rates, have been reported in the Arkansas model when compared to Medicaid expansion states [10]. While the financial effects of ME on net budgetary gains have been identified, impact on high-cost procedures such as ECMO have not, and thus, further stratification of procedural-cost impacts is warranted.

There are numerous limitations to this report. First, the data pertain only to the United States and so are

not broadly generalizable. Second, there is inherent bias within administrative data collected for retrospective data analysis. Third, there are likely to be multiple unmeasured confounders at play. Fourth, the absence of granular data and recipient outcomes preclude an in-depth analysis of the quantitative and qualitative influences that affect decision-making. Fifth, the relative recency of the ACA precludes the ability to evaluate long-term survival. Finally, we do not confer any causal inference but can only highlight a likely multifactorial

association between the implementation of these policy changes and outcomes as a whole, without an appraisal of healthcare reform as a whole.

In conclusion, this is the first preliminary evaluation of the association between the implementation of ME and access to ECMO as a bridge to LT. It represents critical data that suggests that increased access to transplantation may be achievable through a federal initiative. Reversing ME thus may in this vein, theoretically erode many of these gains.

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