Learning Resource Package for Medical Oxygen Management

During the second wave of COVID -19 pandemic, when fatalities due to the coronavirus infection soared across the world, oxygen-supportive care emerged a critical life-saving intervention in the absence of a proven therapeutic solution to COVID-19. Among the various response mechanisms of the Government of India and the state governments, including scaling up medical oxygen production, repurposing industrial oxygen to medical grade liquid oxygen and others, the key initiative was the purchase and installation of nearly 3,750 pressure swing adsorption (PSA) plants in healthcare facilities across the country. While various oxygen systems were rapidly installed to fulfill the immediate gap between supply and demand of medical oxygen, very few staff in the public health systems had adequate knowledge or skills related to oxygen systems. Their know-how was largely restricted to oxygen cylinders, which they had historically relied on to meet their medical oxygen demands.

While the public health leadership in India at national and state levels initiated various virtual as well as classroom trainings to strengthen capacities of the workforce in oxygen therapy and management of oxygen systems, there were huge variations in training quality, as the content and approach varied from trainer to trainer. The materials used during these trainings were neither standardized nor validated or vetted by subject matter experts. There emerged a strong need to develop standardized, evidence-based, and high-quality training and learning materials for oxygen management, including delivery of oxygen to patients. The objective was to build the capacities of workforce handling the existing as well as newly established medical oxygen systems.
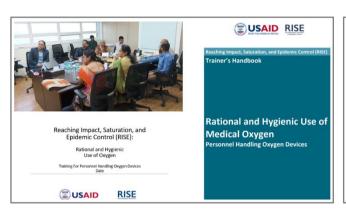
USAID supported RISE program, primed by Jhpiego, engaged the services of PATH in August 2021 to build and upgrade capacities of critical workforce and decision-makers in India for maintenance, operationalization of oxygen infrastructure, hygienic use of oxygen, and respiratory care equipment for successful administration of medical oxygen therapy. PATH brought with itself the experience of working in more than 70 countries to rapidly improve oxygen supply, among other initiatives such as access to vaccines, better disease surveillance, strengthening supply chains, informing policy, strengthening capacities, deploying digital solutions and data strategies, and accelerating innovations. In India, PATH had been facilitating technical support for oxygen management to 15 state governments.
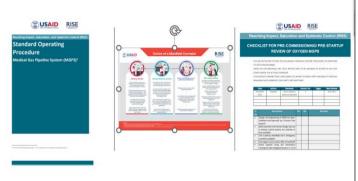
The exercise began with the development of a capacity-building plan in consultation with various stakeholders and subject matter experts. The plan factored in the training needs of different categories of health workers and service providers like medical officers, nursing staffs, personnel handling oxygen devices (technicians, biomedical engineers, among others), and oxygen program managers at the facility, district, and state levels. The training needs were assessed through a systematic training needs assessment exercise. In addition, several rounds of discussions were held with different stakeholders to understand the desired duration for various trainings and the preferred approaches to deliver these trainings. Based on these inputs, the capacity-building plan was developed. It had four modules to meet trainings from one- to three-day long trainings delivered using presentation, discussions, field visits, practical demonstrations, and group exercises.

Relevant content was mapped and extracted through a comprehensive exercise using a wide range of reference materials, such as central and state government guidelines, standard operating procedures (SOP), directives, Medical Oxygen Guidebook used in Maharashtra, the Madhya Pradesh SOP on Medical Oxygen Use and Fire Safety Guidelines, the Government of India's SOP on Rational Use of Oxygen, and numerous other SOPs released by the Central and State

governments. Additionally, training and learning materials developed by PATH on oxygen management were also mapped. The content taken from PATH's global resources were customized and adapted to Indian context.

The final training curriculum was developed as training presentation, facilitators guides, and other learning tools, which underwent three rounds of iterations and validation. The first validation was done internally by PATH followed by external validation by subject matter experts. For service provider modules on rational and hygienic use of oxygen, subject matter experts from country's premier medical institutions like AIIMS Rishikesh, AIIMS Bibinagar, NIMS Hyderabad, BJ Medical College Ahmedabad, SMS Medical College Jaipur, and LNJP Delhi reviewed, validated, and approved the content. After validation, the modules were launched and used while conducting training of trainers (TOTs). A similar approach followed for developing the SOPs and checklists. Some SOPs developed on National Accreditation Board for Testing and Calibration Laboratories (NABL), Medical Gas Pipeline System (MGPS), and Petroleum and Explosives Safety Organization (PESO) was also vetted by industry experts and expert institutes.

As PATH has been working in the area of respiratory care for decades, it has a global repository of material on the oxygen ecosystem. For developing ready reckoners like, USAID RISE utilized PATH's repository of tools modified and adapted them to Indian context and developed them into 11 different multilingual posters in Hindi, English and Gujarati. These posters can be used as ready reckoners by the relevant stakeholders.

To complement classroom learning, mentoring and demonstration, a package of virtual learning system of six e-learning modules on oxygen management was created. The e-learning modules are user-friendly, shorter trainings which can be used for self-paced or refresher training.

By the virtue of these efforts, the USAID RISE team has put together a learning resource package of training modules, ready reckoners like posters and supporting job aids like SOPs and checklists and self-paced e-learning modules. This learning resource package, the first-of-its-kind for oxygen ecosystem globally, provides comprehensive learning, knowledge and skill-building opportunity on medical oxygen management.