

TNECHO TRAINING IN THE ROTUNDA HOSPITAL

Training recommendations for targeted neonatal echocardiography, endorsed by European and North American professional organizations have been published¹³. The approved training guidelines for TNECHO distinguish between “core” and “advanced” training level for TNECHO. The TNECHO program at the Rotunda Hospital is committed to facilitate training in line with the guidelines.

Overall Principles of TNECHO Training

1. Develop a comprehensive understanding of cardiovascular physiology and hemodynamics as it applies to neonatal health and disease
2. Understand the physics and principles of ultrasound
3. Learn all the necessary echocardiography views required to perform a standard TNECHO study
4. Understand the principles of two-dimensional, Doppler and M-mode imaging and their use in functional echocardiography
5. Learn all the necessary measurements and calculations to perform a complete TNECHO
6. Develop the skills and knowledge to apply TNECHO methodology in the setting of clinical decision-making in the NICU
7. Learn advanced techniques for assessing myocardial performance including Tissue Doppler Imaging and strain/ strain rate measurement.

Core TNECHO training

Overall Goal: Obtain all standard imaging views and the ability to perform standard TNECHO that will allow the identification of normal cardiac anatomy and exclude structural heart disease.

To achieve the core neonatal echocardiography competencies a training period of **4-6 months** in the Rotunda Hospital and the oversight of the Paediatric Cardiologist is required. This should allow the performance of more than 150 studies and the interpretation of an additional 150 studies. To guarantee sufficient exposure to normal anatomy and some disease states, it is advised that no more than 20% of these studies can be abnormal. This will allow the trainee in TNECHO to become familiar with normal cardiac anatomy and recognize abnormal patterns suggesting the presence of structural heart disease. At the end of this training period a formal evaluation of the image acquisition competencies should be completed. After the core training, the trainee should be able to acquire the images according to the standard protocols but advanced training is required to be able to read and interpret the TNECHO findings.

Advanced TNECHO training

Overall Goal: Complete, interpret and report a standard TNECHO according to the defined indications reaching a medical recommendation.

The advanced phase of TNECHO training is aimed at further developing the echocardiographic diagnostic skills and also to further develop the interpretation skills. At the end of the training, the candidate should be able to **independently** perform and interpret neonatal TNECHO for the defined indications. The echocardiographer with advanced TNECHO training should also be able to acquire the images according to the standard protocols and interpret the findings in the context of the clinical TNECHO application (interpretation of neonatal hemodynamics). This training requires the additional performance and review of an additional 150 neonatal echocardiography studies. It is suggested that this additional advanced TNECHO training include **another 4-6 months** of training mainly in the context of an NICU, supervised directly by the TNECHO program director in close liaison to the pediatric echocardiography consultant.

Supervision of training

Both core and advanced TNECHO training is coordinated with the pediatric cardiology consultant and neonatal intensive care unit and directed by TNECHO program lead. An established interaction on the interpretation of TNECHO between the NICU and the pediatric cardiologist creates the optimal environment for training and teaching targeted neonatal studies.

Evaluation

1. All candidates should be evaluated by the pediatric cardiologist and TNECHO program lead on a monthly basis.
2. Candidates should complete a series of structured echocardiography related questions to facilitate their learning
3. Candidates should review and perform a critical mass of echocardiography studies consistent with the American Society of Echocardiography Guidelines.
4. Candidates should maintain a structured logbook of echocardiograms performed which will include the indications and findings of the studies. This will facilitate periodic review of the trainee's volume and diversity of experience which is necessary to attain/maintain competence.
5. Formal evaluation through direct observation will be organized for both the core and the advanced level of training. The direct observation in practice (DOPS) evaluation must be activated by the individual. Candidates must achieve the necessary pass mark before transitioning to the advanced phase of training.

Maintenance of competence and quality assurance of TNECHO: After the neonatal echocardiographers have completed the advanced training level in TNECHO, they should continue to perform a minimum of 100 echocardiography studies per year to maintain their skills and competence level.