



## Rely on QCheck Program

**QCheck** onboard staff has been in the field of servicing and maintaining medical instruments for more than 14 years. QCheck understands the significance of X-radiation. Hence they can work as your partner to establish a hazard-free radiology department.

**QCheck** personnel have undergone rigorous training on medical equipments in general and X-ray machines in particular.

**QCheck** Systems, has acquired an expertise to use state-of-the-art technologies for diagnostic radiology and other machine diagnostic tools.

### Q Check Systems

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## QCheck Offerings

- Quality Assurance Program for Type Approval, Registration, Renewal of Registration and Licensing
- Performance Evaluation of existing radiation machines
- Leakage and Scattered Radiation Surveillance and Testing
- Consultancy for room planning and site approval
- Consultation for TLD badge procurement
- Seminar/Workshop on radiation safety and quality assurance



Instruments used for Qcheck



**Secure Radiation  
Ensure Quality**

Quality assurance and surveillance program is a compliance test for diagnostic radiology to provide the best possible image with optimum dose and at minimum cost to the patient and institution.

# About QCheck

**QCheck is a Quality Assurance Program offered to diagnose and measure the deviations in Radiography, Fluoroscopy, Cathlabs, Mammography, CT Scan and Dental X-ray machines, from the accepted standards.**

**QCheck program presents a package of performance diagnostics complimented with radiation survey of X-ray-based equipments, which will ensure quality of the machines as required by law and hospital governing bodies thereby enhancing patient experience.**

## Why use QCheck?

### Legal Requirement

Atomic Energy Regulation Board (AERB) through the Atomic Energy Act 1962 lays emphasis on continual review and improvement of quality management system. The Board recommends quality assurance tests and radiological protection survey of X-ray installation.

### Requirements for Accreditation

National Accreditation Board for Hospitals and Healthcare Providers (NABH) and International Organization for Standardization (ISO) mandates that quality assurance tests and radiological protection survey be made essential for registration of X-ray departments of clinics, diagnostic centres and hospitals.

### Minimize Hazardous Effects of X-ray

X-rays produce biological effects at the cellular level, which may later manifest as clinical symptoms in the human body. Exposure to low levels of radiation creates early local effects depending on the dose rate, while a higher rate can prove fatal. Prolonged exposure to X-ray radiation can cause cataract, cancer or hereditary effects on the progeny of

exposed individuals.

Radiologists suggest retake of a poor quality image. Retakes result in radiation doses to patients, radiological personnel and public. Retake overloads the machine, which reduces the tube life.

The quality test can check for any possible leakages of the machine, minimize retakes and avoid excessive exposure to the radiation.

### Longer life of the Machine

Medicine harps on the theme of 'prevention is better than cure'. Radiological machines which are used continually need the requisite maintenance to stay fit for the purpose. Periodic **QChecks** of the machines will help the hospital administration to take corrective action leading to improvement of life of the machine.

### Green Environment

With radiation leak-proof systems and minimum intrusive effect of the X-rays, a well maintained machine helps in improving the quality of air of the surrounding, thereby providing a green environment.

## When to QCheck?

### Machine Manufacture

Companies manufacturing machines involving X-ray radiation need a Type Approval from AERB before the machines can be sold in the market. Such companies can **QCheck** for obtaining Type Approval.

### Machine Installation

**QCheck** needs to be performed on installation of the machine, as acceptance test, to verify purchase specification and to establish performance baseline.

### Major Repairs

In cases of major repairs like tube replacement, spares replacement, or any other repair that could affect the performance of the machine, **QCheck** needs to be undertaken to ensure regularization of the machine.

### Periodical Checks

X-ray diagnostic equipment must be checked at regular intervals, as monitoring test, to ensure that the machine meets the expected standards. **QCheck** is also necessary for renewal of registration of the equipment to adhere to the AERB norms.

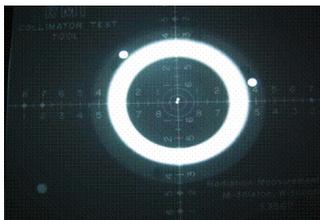
# Tests Conducted under QCheck Program

The quality assurance tests measure the accuracy and consistency of the following parameters, which influence the quality of the diagnostic image and patient dose.

## Congruence of Optical and Radiation Fields

Test to limit the field only to the area of clinical interest of the patient. If the optical field and radiation field are not congruent the area of clinical interest may be missed in the radiograph leading to retake and unnecessary radiation to patients.

## Central Beam Alignment



Test to make the X-ray beam perpendicular to the image receptor. If the beam is not perpendicular the image may be distorted. If grid is used the distortion will be magnified resulting in complete loss of minute details.

## Focal Point Size

Test to ensure that the ability of the machine to resolve the smallest size of the image remains intact.

## Exposure Time

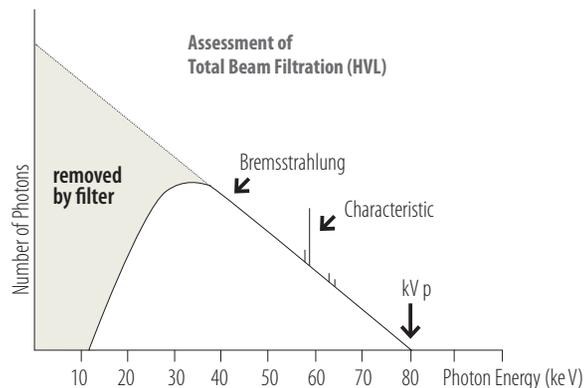
Test to control the exposure time to radiation in order that the radiograph does not get under exposed or over exposed.

## Peak Kilovoltage (kVp)

Test to maintain the expected voltage for quality and quantity of X-rays, since any changes can alter the contrast and density of the radiograph.

## Total Filtration of X-ray Tube

Test to cut-off low energy components from the X-ray beam that do not contribute to image formation but result in patient exposure. The total filtration has to be optimum for patient safety and image quality.



## Linearity of Timer and mA Station

Test to ensure consistent radiation output. Keeping the kVp and time constant the radiation output is measured at different mA stations. The coefficient of linearity should not exceed 0.1.

## Radiation Leakage

Test to measure radiation leakage, which needs to be below the standards prescribed by AERB safety code. The radiation leakage is measured using an ionization radiation survey meter.

## QCheck Methodology

The QCheck methodology involves the performance evaluation test of the X-ray diagnostic equipment followed by a corrective action and re-checking if the action has restored the quality standards. Based on the 'measure-correct-measure' principle, the QCheck methodology goes through the following cycle –

1

QCheck personnel will carry out the tests for quality assurance to measure the accuracy and consistency of the parameters prescribed by AERB.

2

The results from these tests are properly recorded. A report is generated for all tests conducted under the program.

3

The results are analyzed to understand the deviations in the machine from the standards prescribed by AERB.

4

If the results are not satisfactory, QCheck suggests corrective and preventive measures to be undertaken.

5

On the corrective measures being taken, the machine is re-checked using the requisite performance evaluation tests.

