

Reflections

One of the most advanced sectors in our society, in terms of testing, is the Medical Sector.

Analogies in terms of diagnosing and testing from this sector are:

When e.g. MRI scanning is performed at the hospital, the operators are top trained in the use of the MRI. They know exactly what they are looking for. e.g. what organ and the possible anomalies the task is related to, and they set the parameters of the MRI accordingly. Subsequently, the MRI images are interpreted by an experienced doctor, usually two of them, before a solid conclusion is reached.

Biopsy of Tumors are investigated in the microscope by experienced pathologists in the laboratory. They have a life-long education and can come up with quick and reliable conclusions.

Similarly, Rheumatologists, specialized in ultrasound investigations of muscles and tissues, are going through course after course, and receive their accreditation after 6 months of practicing, supervised by a specialist. They will be able, quickly, and reliably, to locate the tiniest muscles that are affected by arthritis and do injection exactly into these small muscles to remedy the pain.

If bone fractures occur, X-Rays are important in diagnosing, treatment, and cure.

By courtesy of
Soccer-Player,
NDTitan
Hugo Orozco



By courtesy of
Rugby-Player,
NDTitan
Dr. Nicholas
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The X-Rays are well done, ready for interpretation.

The left X-Ray is rather simple to interpret - broken arm, and no fractures in the wrist bones. The middle X-Ray is also rather simple to interpretate, a clean broken leg bone.

The right one is much more difficult, but a trained doctor would recognize this as a “Weber Type A lateral malleolar fracture”, barely visible within the circled region. Recognition of this fracture requires an understanding of the expected image of a normal ankle and typical ankle fractures that are encountered.

What can be learned from these examples from Medicine, when we talk about testing of concrete structures?

For sure they are different areas of expertise, Medicine and in Construction. However, the same basic principles apply:

1. Test the structure (the patient), don't rely only on laboratory testing, especially for production control where it is the final quality of e.g. the cover layer that is important in terms of durability
2. Specify the testing problem to be solved
3. Select the test system(s) that may solve the problem, usually in combination with others, e.g. petrographic analysis or diffusion modelling for service life
4. Profound knowledge of test system(s) and the underlying scientific principles is needed.
5. Training in the test system(s), also
6. Collect drawings and personal information in preparation for a testing job
7. Understand the problem and specify it together with the client
8. Select the right test system(s) after the discussions
9. Do proper homework, e.g. for injection of cable ducts using impact-echo
10. Preferably perform a limited pilot test study, on-site
11. Confirm findings by coring/breakouts.
12. Calibrate further, e. g. with other test systems
13. Reach a conclusion whether the testing problem can be solved
14. If "Yes", perform the final testing, on-site
15. Interpretate the results seen in relation to the specified problem
16. Any new information turning up during testing?
17. Reach a conclusion, preferably on-site
18. Produce a clear, short report

Blindly collecting a lot of data gives no meaning. Keep the purpose of the testing in mind, and reach a solid conclusion, based on a minimum amount of data.

On-site testing is often an iterative process, going back to the original purpose as testing progresses.

Assure strong technical support during and after testing, especially in the interpretation of the data.

As in the medical sector, NDT in construction needs continuous practice and proper testing in the field to get experience. The key word is "**Experience**".

In addition to testing experience, the testing engineer should preferably have structural engineering knowledge to understand the structure.

The NDTitans offer these services, profound knowledge of the systems and the underlying principles in relation to concrete science as presented in the NDTitans Workshops.

The NDTitans are furthermore available for testing jobs, training, continuous education, discussions, and support during a testing project.