CT-Expo ‘Light’ Pro – CT Dose Assessment Made Easy but Precise

When we decided about 10 years ago to develop CT-Expo, a few scanners only were able to display some dose information in terms of CTDI$_{vol}$. Over the years, not only CT-Expo has been continuously updated and improved. Today, the majority of scanners provide both CTDI$_{vol}$ and DLP, either at the scanner’s console or in the dose report of the exam. So there is no absolute need to calculate these values any longer.

However, effective dose and organ doses are still missing. Both are helpful to compare with exposures from other sources. Also to give patients a chance to understand which level of radiation they have received from their examination and to explain why it was not necessary to apply protective devices. Or to verify dose information presented in scientific literature and manufacturer’s brochures.

By dealing with CT-Expo over the past years we have experienced a lot about the dosimetric properties of different scanners. It turned out that – with CTDI$_{vol}$ and DLP as input – assessment of effective and organ doses can be made independent from the type of scanner with an agreement of ±10% compared to CT-Expo (module ‘Calculate’). However, this only holds true as long as both length and location of the scan range are almost identical to the ones that were assumed in the definition of the underlying conversion factors. As a consequence, a more refined classification of scan ranges is required, much more than only subdividing the patient into head, neck, chest and abdomen.

About 10 years ago as well no person (except maybe Steve Jobs) could imagine such small but powerful mobile computing devices like iPhones or iPads. So how would it be to have CT-Expo always in your pocket, with full capability, not only with a few coarse conversions from DLP to a single effective dose, and with a minimum of input instead of having to start Excel and CT-Expo each time plus the need to enter all required exposure settings?

Now, after several exciting months of developing, programming and rigorous verification, we are happy to present CT-Expo ‘Light’ Pro. This app combines the functionality of CT-Expo’s modules ‘Calculate’ and ‘Standard’, but requires not more than selecting one out of 40 scan regions and to enter CTDI$_{vol}$ and DLP. Please find below a one-pager with specifications and screenshots of all relevant views.
Both the ‘Classic’ and the ‘Dark’ edition are exclusively available at Apple’s App Store and will run on all iPhones, iPads and iPod Touch devices operating with at least iOS 3.0. For all those who should be interested in this app but don’t yet own an iPhone or iPad, we recommend at least the smallest iPod Touch (8 GB). This device offers a number of otherwise useful capabilities (mp3, video, camera, applicability of all iPhone apps, internet access via WLAN) at a very reasonable price. Access to the App Store and app installation on your device is also possible for Windows users without problems via iTunes that is available for free.

To prevent some disappointment: CT-Expo ‘Light’ will currently not offer dose assessment for infants and children. As the vast majority of scanners still don’t give clear indication whether the recorded dose values refer to the 16 cm head phantom or to the 32 cm body phantom, we felt it untrustworthy to leave the user with an uncertainty of factor 2. However, once the situation will have changed, we will add this functionality in the future. For the time being we recommend the MS Excel version of CT-Expo.

Compared to the app version, the full version of CT-Expo offers additional features – paediatric dose assessment, benchmarking of CT protocols, and the possibility to study the influence or parameter settings on patient dose. CT-Expo will therefore remain in our portfolio and will continuously be updated as before. The next update (v2.1) is in preparation and will be made available in the course of this spring.

We would be happy if you should like the new CT-Expo app as much as we do. If this should be the case, we wouldn’t mind if you recommend it to your colleagues and friends. And if not, we would appreciate if you could let us know why.

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HD Nagel & G Stamm

7 major languages: English, German, French, Spanish, Portuguese, Swedish, Japanese

40 different types
- Head (7)
- Body (14)
- CTA (10)
- Bone (9)

Detailed information:
- Scan ranges and anatomical borders (for information only)

Only CTDIvol and DLP required
- 2560 different conversion factors for specific dose assessment behind

Effective and organ doses
- Both genders
- Old and new ICRP
- 30 organs / tissues

About CT-Expo ‘Light’
CT-Expo Light is a new, but powerful app for mobile devices based on the industry-leading CT-Expo dose evaluation software. It’s designed to calculate effective dose and organ doses according to ICRP 103 and ICRP 123 for a large variety of CT examinations. In addition, doses for all relevant organs and tissues can be assessed, too.
Dose calculation is performed independently from the type of scanner. Only the corresponding CTDIvol and DLP values, obtained either from the scanner’s console or from the examination report, are required. The calculation is done after selecting the type of examination, either from the scanner’s console or from the examination report, and the dose is calculated automatically.

Select type of examination
- Select the type of examination
- Select the CTDIvol and DLP values
- Read the resulting dose values – more

Input dose values
- Chest & upper abdomen
- CTDIvol (mGy) 7.8
- DLP (mGy.cm) 190

Results
- Chest & upper abdomen
- Effective Doses (mGy)
  - ICRP 103: 6.6
  - ICRP 123: 8.1
- Organ Doses (mGy)
  - Liver: 10.5
  - Kidney: 11.2
  - Spleen: 11.2

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2 different designs:
- Classic Edition
- Dark Edition