

## Danish Centre for Evaluation and Health Technology Assessment

# X-RAYS OF THE LOWER BACK IN THE 20 TO 49 AGE PATIENT GROUP REFERRED FROM PRIMARY SECTION

Claus Løvschall<sup>1</sup>, Lars Ehlers<sup>1</sup>, Mette Kjølby<sup>1</sup>, Klaus Doktor<sup>2</sup>, Niels Frederik Pedersen<sup>3</sup>,  
Michel Bach Hellfritsch<sup>4</sup>, Niels Würgler Hansen<sup>5</sup>, Michael Svarer<sup>6</sup>

1. MTV-unit at Aarhus University Hospital
2. Nordic Institute for Chiropractic and Clinical Biomechanics (NIKKB)
3. General Practitioner, Grenaa
4. Department of Radiology, NBG, Aarhus Sygehus
5. National Board of Health, Danish Centre for Health Technology
6. Institute of Economics, Aarhus University

X-rays of the lower back in the 20 to 49 age patient group referred from primary section

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For further information please contact:

National Board of Health

Danish Centre for Evaluation and Health Technology Assessment

Islands Brygge 67

DK-2300 Copenhagen

Denmark

Phone: +45 72 22 75 48

E-mail: [dacehta@sst.dk](mailto:dacehta@sst.dk)

Home page: [www.dacehta.dk](http://www.dacehta.dk)

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# Summary and conclusion

## Conclusion

The most essential conclusions in the report are:

- For patients in the 20 to 49 age group x-rays of the lower back should primarily be used for “red flag” situations (indicate e.g. fracture, infection, arthritis, tumour).
- There is no support for automatically referring a patient with unspecified lower back pain for x-ray after a certain period. By contrast, a new British clinical randomised study shows that such an approach has no effect.
- 12 out of 13 earlier and new guidelines however recommend that the patient be referred after a certain period. On the lines similar to the latest guidelines from DSAM, it is recommended that the clinician may refer the patient for x-ray after six weeks with unspecified lower back pain.
- There is no support for the assumption that the patient’s condition (e.g. emotional wellbeing) should prevent a change in consumption.
- From 1998-2004 the consumption at chiropractors has decreased by 32%, while the consumption with referral from GPs has decreased by 12% (statements from six counties).
- From 2003-2004 minor rises have been registered in the consumption of 5% and 3% for chiropractors and GPs respectively.
- The discrepancy between the data extracts from local hospital units (county wise) and the Danish National Patient Registry (LPR) regarding x-rays of the lower back is on average 6%, and for some counties up to 14% (figures from 2004).
- Some counties probably have unexplained overconsumption of x-rays for the diagnosis of lower back pain. Theoretically and according to the economic model, this may be interpreted as practice variation. The literature points towards it being a case of overconsumption rather than underconsumption.
- Subject to the assumptions included in the model, the economic analysis has estimated the potential savings at approx. DKK 1.6 million annually. The total costs of x-ray of the lower back in patients in the 20 to 49 age group referred from the primary sector amount to approx. DKK 27 million per year.
- According to experience from the foreign cost-effectiveness analyses, the economic costs of patients with lower back pain are in general lower in courses without the use of x-ray than in patient courses including x-ray.

## Background

Back pain is a very common problem in Denmark, and within one year 35% of the population inform that they have had temporary or persistent pain in the lower back. Lower back pain comprises a large number of symptoms and conditions. Danish figures show that 37% of the persons with lower back pain choose to seek treatment within one year; the majority from own GP or chiropractor.

Primarily the diagnosis in patients with lower back pain includes a clinical resolution, which in indicated cases is extended by an x-ray. No Danish figures exist of the number of referrals for x-ray of the lower back, but a Swedish study has shown that 38% of the patients who contacted the GP had an x-ray within one month of the onset of the disease.

The x-ray is primarily justified in exposing the incidence of a serious underlying disease, e.g. tumours, infections or fractures. However, in relation to the unspecified lower back pain the x-ray is very controversial, and several researchers and clinicians to a greater extent than previously are reserved regarding the use of x-ray as a diagnostic device.

According to current legislation the chiropractor profession comprises: “Diagnostics, prevention and chiropractic treatment of biomechanical functional disturbances of spinal column, pelvis and extremities”. Furthermore, the legislation provides that the chiropractor for purposes of diagnosis may perform x-rays of the above indication area.

## Objective

It is necessary to clarify whether the x-ray consumption compared to patients with lower back pain in practice is managed appropriately. The report focuses on the x-ray examinations performed based on referrals from the primary sector, which include x-rays with referral from the GP and x-rays at the chiropractor's clinic. Approx. 83% of the x-rays of the lower back in the 20 to 49 age group are based on referral from the primary sector.

The assessment is performed using three perspectives. 1) The technology perspective, in which the indication area for use of the x-ray is defined. 2) The patient perspective, in which the patient's need for the examination is assessed. 3) The organisational/economic perspective in which the counties' consumption are assessed comparatively.

## Method

The report uses an evidence-based approach and is attached to national/international HTAs and clinical guidelines within the area, review articles as well as recent primary studies that are not assessed in connection with a systematic follow-up. Literature search and assessment has been carried out based on an already established protocol. Specific search strategies have been prepared, and these are maintained as documentation. The analysis of the organisational and economic perspective is mainly based on data and registry extracts collected in connection with the preparation of the report.

## Results

### Technology

The x-ray is no longer a routine examination for the resolution of unspecified lower back pain and should particularly be reconsidered for the 20 to 49 age group, as the usefulness often is doubtful. Generally, in connection with unspecified back pain there has been little relationship shown between the patient's symptoms and the x-ray findings. In the absence of a specific suspicion an x-ray may be considered after six weeks of persistent lower back pains without signs of improvement. However, preliminary studies are doubtful of the clinical effect of x-raying patients after a given period of time.

In connection with specific back pains and “red flag” situations in which there is normally an indication for x-raying, the examination is primarily of value at suspicion of fracture and other pathology (infection, arthritis and primary or secondary tumour). The x-ray may be recommended as first-line in connection with these clinical conditions.

### Patient Perspective

Scientific studies document – primarily based on secondary endpoints – that satisfaction and emotional wellbeing are factors, which can be improved by x-raying patients with lower back pain. The clinical effect is marginal and the scientific basis is flimsy. Furthermore, satisfaction should not be stated as an indication for an x-ray, and thus there is no support for patient conditions preventing a change in consumption. However, the patient has expectations of being x-rayed and of the result of the x-ray. To meet this requirement it should be assessed whether information or other strategies should be initiated.

## **Organisation**

The basis for the section on organisation has been to collect a complete data extract regarding the number of x-rays in connection with the diagnosis of lower back pain. Systematic accounts of the number of x-rays of the lower back referred from the primary sector have not previously been carried out. The accounts are complete with regard to reports from all involved units and clinics, however, not for all years.

In 2004, 37,384 x-rays of the lower back were performed in patients in the 20 to 49 age group with referral from the primary sector. 23,682 x-rays were referred from the GP, and 13,702 x-rays were undertaken at the chiropractors. From 1998-2004 the consumption at the chiropractors has decreased by 32%, while the consumption with referral from GPs has decreased by 12% (statements from six counties). From 2003-2004 minor rises have been registered of 5% and 3% for chiropractors and GP's respectively.

The consumption varies considerably between the counties with a variation span from 13.7 x-rays per 1,000 inhabitants per year in the county with the lowest figure to 24.3 x-rays per 1,000 inhabitants per year in the county with the highest figure (figures from 2004).

With a view to assessing the validity of hospital data a comparison has been made between local extracts (from the unit) and data extracts from the LPR. The discrepancy between the two data extracts is on average 6%, and for some counties up to 14%.

## **Economy**

A systematic comparison (or benchmarking) has been carried out between the number of x-rays of the lower back in the 20 to 49 age group in the individual counties, including H:S (the municipalities of Frederiksberg and Copenhagen) using an econometric method. Furthermore, an estimation has been prepared of how much the consumption of x-ray "can be reduced" by means of standardisation.

The estimates show that it is a question of significant differences in the consumption of x-ray, even when adjusted for differences of socio-economic nature and number of x-ray units/clinics in the individual counties.

The total consumption of x-ray of the lower back in the 20 to 49 age group amounts to approx. DKK 27 million annually. An estimate of the potential savings by reducing the practice variation has been calculated to approx. DKK 1.6 million (95% prediction interval DKK 0.3-4 million).

## **Research and development initiatives**

Clinical studies documenting the genuine clinical effect of x-raying patients with lower back pain are needed. The effect of x-raying after six weeks of unspecified pain should also be further documented.

In addition, studies are needed, which based on primary endpoints document the patient related consequences. It should furthermore be documented whether information can function as an equal alternative to the x-ray.

A more uniform and consistent registration practice is required. This applies especially to registration of "form of referral" – i.e. who referred the patient. The increase in the consumption from 2003-2004 shows that focusing on lowering/maintaining the consumption is still needed.