

# TEXRAY.

## PROTECT YOUR BRAIN

Reduce your exposure  
to scatter radiation



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0598

MADE IN SWEDEN 

# THE HEART AND SOUL OF TEXRAY™

## STATE-OF-THE-ART SMART TEXTILE Revolutionizing personal radiation protection

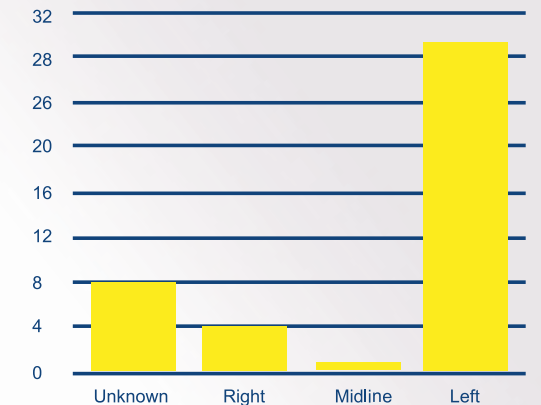
Personal radiation protection devices used to protect from harmful ionizing radiation are sometimes unpractical and difficult to use, resulting in unprotected body parts. Some protective garments can be uncomfortable and, heavy.<sup>1</sup> The commonly used materials do not always allow a human-centered design or durable protection. With Texray we may change that.

We have invented a revolutionizing novel material platform with a woven textile technology. The essence of the textile is the attenuating capacity which protects you from potentially harmful radiation. With our innovation we enable unparalleled comfortability with pliable and breathable designs. Leaving you to stay focused, highly protected and with peace of mind in the OR.

# RADIATION AND YOUR BRAIN

Well established is that during fluoroscopy assisted interventions, depending on factors such as patient obesity, procedural complexity and fluoroscopy time, medical practitioners are subjected to relatively high radiation exposure.<sup>2</sup> The current standards and practices are based on the premise that any radiation dose may result in unfavorable health effects.<sup>3,4,5,6,7</sup>

Alarming, over 50% of OR staff do not feel adequately protected from radiation in the OR.<sup>8</sup> However, the risk for developing radiation-induced diseases is still an ongoing debate among experts.<sup>9</sup>



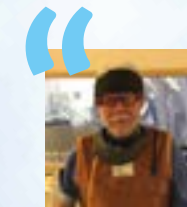
A study on brain tumors occurring in medical practitioners with exposure to ionizing radiation documented 85% left sided malignancy. Data available for 35 of 45 cases on the side of the brain involved. This accumulation of left-sided versus right-sided tumors could be due to the operators routine working position.<sup>10</sup>

## OCCUPATIONAL HEALTH RISKS THAT MAY BE RELATED TO RADIATION EXPOSURE:

- + tumors/cancer<sup>10</sup>
- + cognitive impairments<sup>11,12</sup>

## REPORTED ERGONOMIC ISSUES:

- + back/neck pain from using heavy and uncomfortable radiation protection devices.<sup>1</sup>



*"There is no cut-off point for radiation-induced DNA-damage. Learn your IR fellows not only about interventions, but also about radiation."*

J. A. Reekers, Prof. Emeritus of Radiology, Amsterdam University, The Netherlands.  
Editor-in-Chief CVIR Endovascular Journal



# MAXIMIZE YOUR RADIATION PROTECTION



*"Everything that reduces radiation is welcome, I think these products are very comfortable even after a few hours in the OR."*

Prof. U. Schäfer, Interventional Cardiology,  
Bundeswehr Zentralkrankenhaus,  
Koblenz, Germany

**97%**

**Additional dose reduction.<sup>13</sup>**

## MindPeace™ - the extended thyroid collar

- + Unique extended neck panel protection (patent pending).
- + Radiation doses can be reduced by 76-97% during fluoroscopy-assisted interventions.<sup>13</sup>
- + Reduces your radiation exposure to the lower and middle section of your head.<sup>13, 14</sup>
- + May reduce scatter radiation towards your eyes.<sup>15</sup>
- + Lead equivalence 0,35 mm Pb, total product weight: 422 gram

## HeadPeace™ - the comfortable headband



- + The attenuation efficiency range from 76 to 97% in radiological interventions.<sup>13</sup>
- + Reduce radiation exposure towards the upper section of your head up to 20 times.<sup>16</sup>
- + Proven for its comfortability and to have no negative effect on your head and work postures.<sup>17</sup>
- + Lead equivalence 0,25 mm Pb, total product weight: 247 gram



# SCIENTIFIC EVIDENCE

PHANTOM STUDY  
74% ADDITIONAL  
DOSE REDUCTION

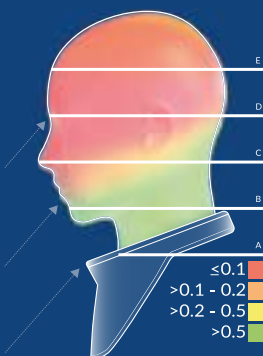
Texray HeadPeace and MindPeace were evaluated for reducing radiation exposure to the head and neck during clinical interventions. A standard thyroid collar and a ceiling-mounted lead glass shield were used as comparison.

## RESULTS

Preliminary TLD data showed that MindPeace (extended thyroid collar) reduce radiation in the throat, chin, and ear slices (A, B, C). Some shielding effect using MindPeace was also seen in the brain and skull slices (D, E). For the standard thyroid collar a reduction was only seen in the throat slice (A) and partly in the chin slice (B). HeadPeace showed a shielding effect in the skull slice (E) up to 2 cm depth where HeadPeace covered the phantom head.

## STANDARD THYROID COLLAR

Schematic illustration of the reduction ratios for a standard thyroid collar in phantom slices A, B, C, D, E for the investigated exposure situation.



	A	B	C	D	E
1.1	0.97	0.15	0.06	0.06	0.10
2.1	0.97	0.07	0	0.11	0.03
3.1	0.88	0.17	0.11	0.05	0.09
4.1	0.80	0.32	0.04	0.09	0.03
9.1	0.58	0.72	0.66	0.19	0.25
1.3	0.96	0.50	0.10	0	0.07
2.3	0.93	0.44	0	0.04	0
3.3	0.80	0.63	0.09	0.04	0.08
4.3	0.80	0.86	0.15	0.11	0.11
8.3	0.59	0.85	0.70	0.29	0
10.3	0.38	0.82	0.64	0.43	0
11.3	0.70	0.87	0.73	0.31	0
16.3	0.91	0.73	0.01	0.01	0
M2	0.71	0.92	0.48	0.21	0



## CONCLUSION

For optimal radiation protection, devices that protect the entire operators head against scattered radiation should be used. However, in clinical practice, this may not always be possible. Moreover, particularly during complex cases when radiation protection may be most relevant, optimal placement of lead glasses may not always be achievable. HeadPeace and MindPeace may therefore provide complimentary protection.<sup>14</sup>

## COMBINATION OF HEADPEACE AND MINDPEACE

Schematic illustration of the expected result if MindPeace and HeadPeace reduction ratios were combined for the different phantom measurements in slices A, B, C, D and E.



	A	B	C	D	E
1.1	0.97	0.95	0.84	0.17	0.90
2.1	0.97	0.94	0.73	0.19	0.90
3.1	0.90	0.94	0.51	0.08	0.90
4.1	0.86	0.95	0.46	0.15	0.90
9.1	0.62	0.83	0.55	0.32	0.58
1.3	0.95	0.96	0.84	0.20	0.22
2.3	0.89	0.87	0.81	0.18	0.17
3.3	0.84	0.96	0.75	0.08	0.40
4.3	0.83	0.94	0.75	0.24	0.50
8.3	0.59	0.82	0.69	0.46	0.23
10.3	0.56	0.80	0.69	0.38	0.32
11.3	0.70	0.94	0.76	0.48	0.40
16.3	0.91	0.92	0.78	0.54	0.70
M2	0.01	0.94	0.86	0.53	0.55



CLINICAL STUDY  
97% ADDITIONAL  
DOSE REDUCTION

The dose exposure in the head area of medical practitioners during interventional radiology procedures was quantified using thermoluminescence detectors which were calibrated to Hp(3). In addition, the protective effect of the Texray products was examined.

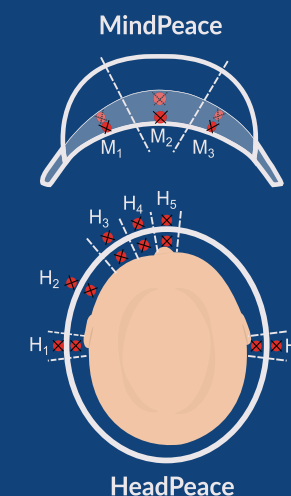
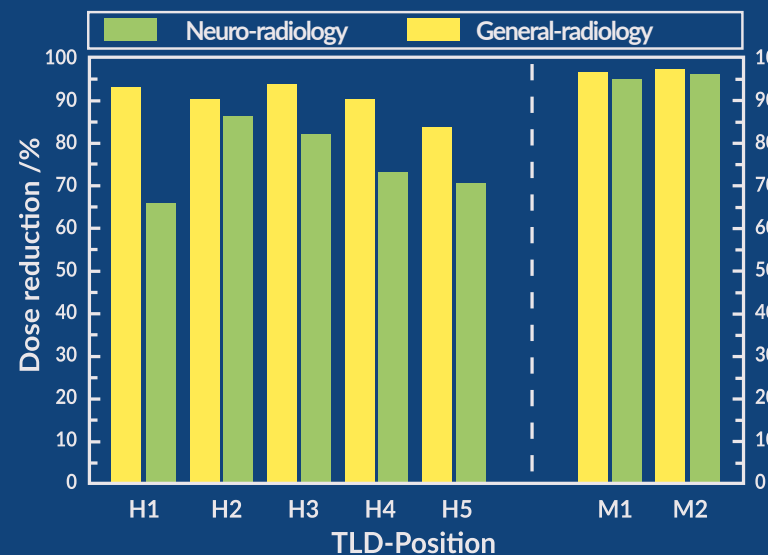
## RESULTS

The study showed a significant dose exposure of the head area with dose values of up to 4.4 mSv after only 20 examinations. The protective effect was determined by evaluating the relative transmission depending on the dosimeter position. In neuroradiological interventions, the mean attenuation by HeadPeace was (90.3 ± 3.6)% and by MindPeace (96.7 ± 0.5)%. In general radiological interventions, a mean attenuation by HeadPeace was (75.5 ± 7.5)% and by MindPeace (95.5 ± 0.6)%.

## CONCLUSION

The attenuation efficiency ranged from 75.5-96.7% depending on the product and operational area. From a radiation safety perspective, wearing HeadPeace and MindPeace is recommended during fluoroscopy- assisted interventions.<sup>13</sup>

Measured TLD-Values		TLD-POSITIONS								
		HeadPeace / mSv						MindPeace / mSv		
		H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	H <sub>4</sub>	H <sub>5</sub>	H <sub>6</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>
Neuro-radiology	outer	0.26	0.27	0.29	0.23	0.31	0.00	0.41	0.49	0.04
	inner	0.02	0.03	0.02	0.02	0.05	0.00	0.01	0.01	0.04
General radiology	outer	1.59	1.91	1.54	1.25	1.43	0.11	2.63	4.41	1.03
	inner	0.54	0.26	0.28	0.34	0.43	0.04	0.13	0.17	0.14



# UNIQUE SWEDISH DESIGN

*"I believe these novel shields are a great innovation for extended protection and optimized comfort. I find it personally very important to minimize my radiation exposure during endovascular procedures, for my own safety and health."*



+ To meet hygienic requirements outer material is made from high quality textile, enabling breathability and cleaning.

+ Pliable and comfortable towards your skin with a soft touch fabric feel.

+ Added protection in clinical practice when optimal positioning of lead shields are insufficient or improperly positioned.

+ Improves ergonomic parameters such as: anthropometrics, biomechanics, water vapor transport, thermal sensation.<sup>1</sup>

+ Reduces radiation exposure to human body parts commonly not protected.<sup>14</sup>

+ Proven for its functionality and usability in clinical environments.<sup>13</sup>

+ No compromise on your, patient and medical outcomes.<sup>16</sup>

+ 30 times more durable compared to competitive materials, preventing prematurely, unsafe tears.<sup>18</sup>

+ Lead-free material eliminating highly toxic lead dust exposure with irreversible health effects on vital organs.<sup>19</sup>

+ Adjustable for perfect fit and compatible with eye-lead glasses. HeadPeace comes with Velcro and MindPeace with magnetic closure.

PROTECTION:	Texray™
LEAD EQUIVALENCE:	HeadPeace: 0,25mm Pb MindPeace: 0,35mm Pb
EC CERTIFIED ACCORDING TO:	EU Regulation 2016/425 on PPE
TESTED ACCORDING TO:	IEC 61331- 1/3 2014
CLEANING:	Lukewarm water and soap solution
CLOSING:	HeadPeace: Elastic soft velcro MindPeace: 3-step magnet
COVER TEXTILE:	Breathable high-quality polyester
SIZE:	S   M   L
COLOUR:	Black (standard)

ART. No.: HeadPeace: PHP1025S | PHP1025M | PHP1025L  
MindPeace: PMP3035S | PMP3035M | PMP3035L



*"Texray innovative protectors, are highly appreciated. I will continue doing advanced image-guided surgical procedures for many years, so radiation is definitely a relevant issue for me and my colleagues."*

Prof. J. Schmitto, Cardiothoracic, Transplantation and Vascular Surgery, Medical University Hospital Hannover, Germany



+ LEARN MORE AT  
[www.texray.io](http://www.texray.io)

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Before using Texray products, we kindly advise you to read the Instruction For Use and the product disclaimer found on Texray website. If in doubt please contact your local Texray Distributor or Texray AB directly by email.

[www.texray.io](http://www.texray.io) | [info@texray.io](mailto:info@texray.io) #OccupationalRadiationEquipment

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