



## **WP7 - Digital skills for Therapy Radiographers (TR)- a document analysis**

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**SAFE Europe**  
Safe And Free Exchange of  
EU Radiography Professionals  
across Europe

# Disclaimer

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## **Background**

- ◆ EU Digital skills agenda
- ◆ Digital Skills for TRs

## **Literature review**

- ◆ Methodology
- ◆ Results
- Discussion/Conclusion

## **Future directions**



Content

# EU Digital Skills agenda

*“Digital skills and related concepts, such as digital competence, have become key terms in the discussion on the kind of skills needed by citizens – in Europe and beyond – to participate and thrive in our society...”*

European Commission 2010; Ferrari 2012; Gallardo-Echenique et al. 2015



# And Digital Skills for TRs?

- Key role in health care provision
- New technological challenges (diversity of software)
- Role expansion and shift of responsibilities



<https://www.coventrytelegraph.net/lifestyle/nostalgia/gallery/old-news-sports-photos-taken-11295826>



<https://www.itnonline.com/content/establishing-igrt-program-observations-two-treatment-centers>



# Digital Skills for TRs

I just told you that there is no common regulation for that, yet !!!

What????



**Aim:** Assess the literature and identify the relevant digital skills for Trs.

# Methodology

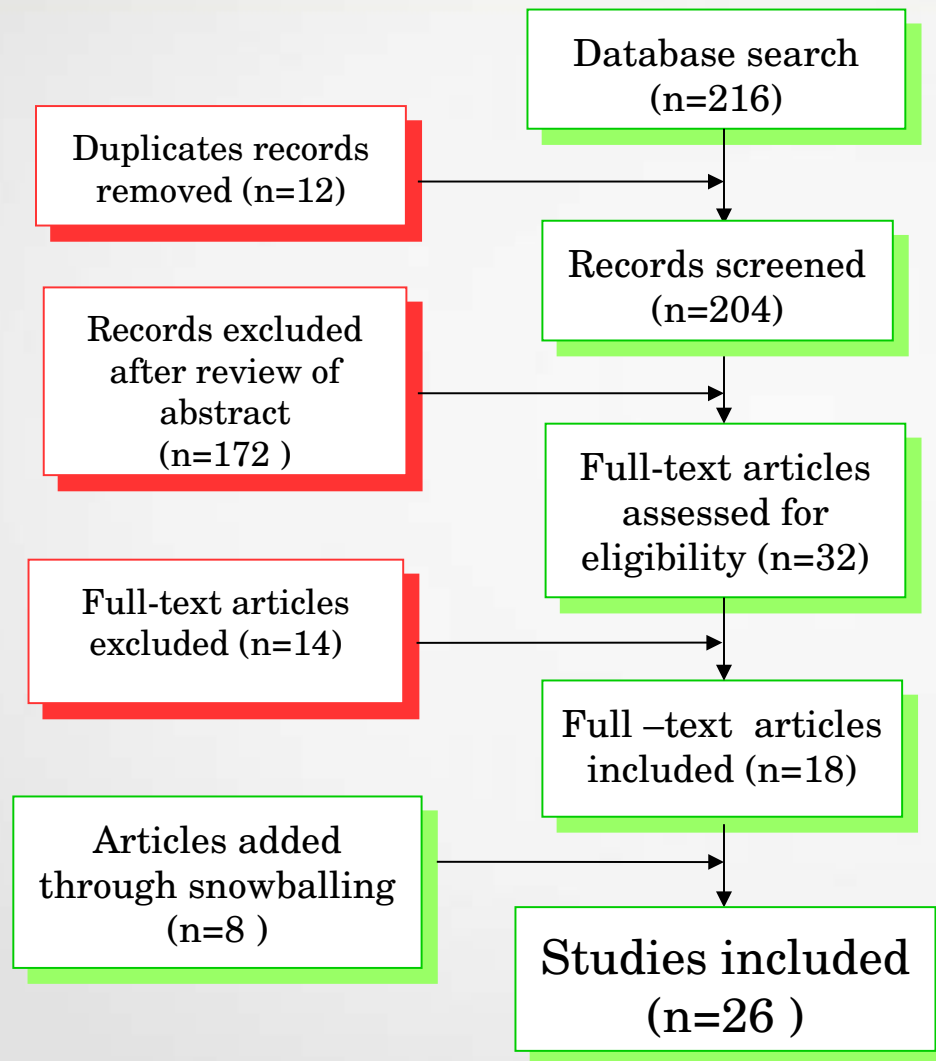
## Systematic search:

- ✓ Databases and Journals:
  - ✓PMC
  - ✓Science Direct
  - ✓ERIC
  - ✓Cochrane Library
  - ✓PubMed.gov
  - ✓IEEE Xplore
  - ✓Radiography Journal
  - ✓TipsRO Journal
- ✓ Zotero Software
- ✓ Two reviewers

## Query:

(digital) AND (competenc\* OR task\* OR skill\*) AND (“therapeutic radiographer” OR “therapeutic radiography” OR radiographer\* OR radiotherapist\* OR RTT\* OR “radiation therapist” OR “radiation technologist” OR “radiation therapy technician” OR “Radiological technologist” OR “Radiological technician”) AND (radiotherapy OR “radiation therapy” OR “radiation oncology”)

# Literature Selection Process



## Inclusion criteria:

- 10 year period
- Languages: EN/PT
- Focus on TR's digital skills

## Exclusion criteria:

- Focus on digital skills of other healthcare professionals
- Irrelevancy to the topic of research



# Methods

## Radiotherapy

- ✓ Benchmarking documents
- ✓ Recommendations documents
- ✓ Educational guidelines

## Digital skills/competencies

- ✓ EU' Digital Programmes
- ✓ European projects (reports)
- ✓ International frameworks

## Technical Publications

- ✓ User guide manuals
- ✓ Reference guide manuals

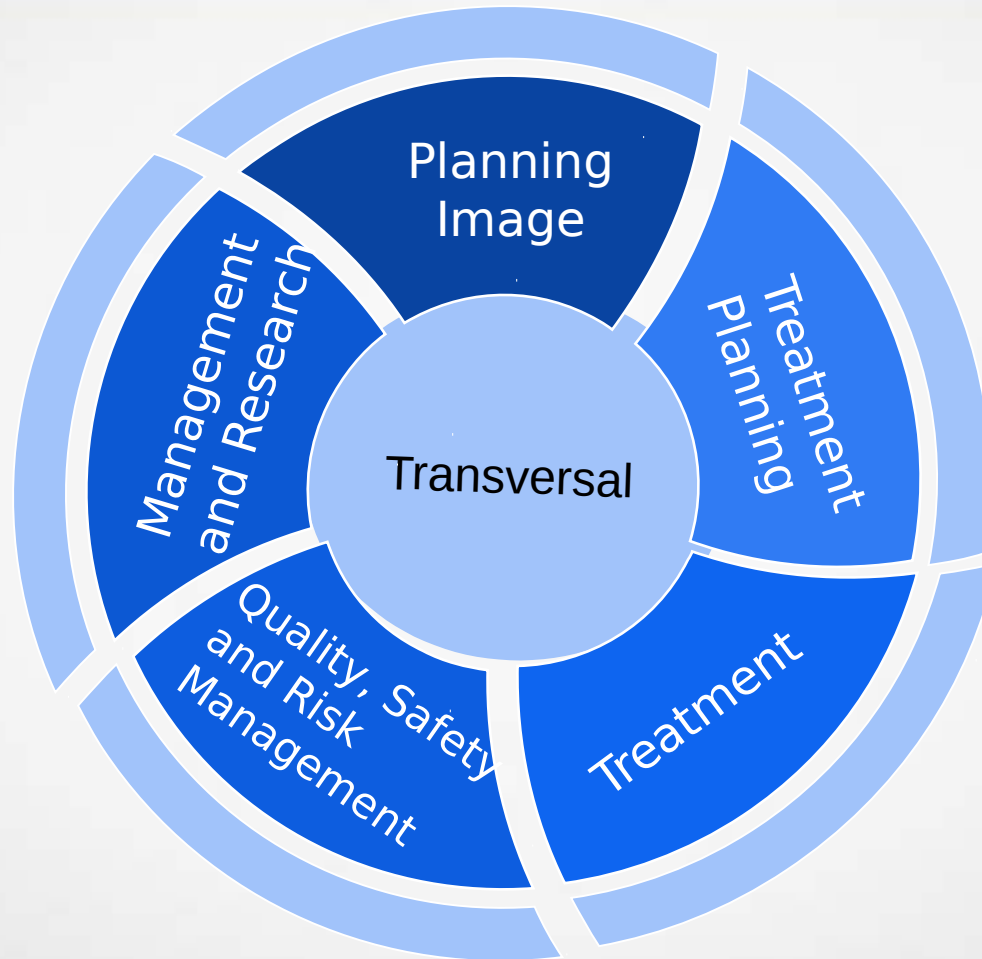


# Results

I can't find anything!



# Results



## Transversal

- Technologies/ Information Systems (IS)
- Communication
- Electronic Patient Record (EPR)
- Patient Agenda
- Workstation

## Planning Image

- Computerized Tomography
- 4D Computerized Tomography
- Image Processing and Enhancement
- Image Registration and Correlation
- Image Segmentation and Contouring

## Treatment Planning

- Plan treatment
- Plan parameters
- Dose calculation
- Inverse planning (IMRT/VMAT)
- 4D planning
- SRS/SBRT planning
- Plan evaluation
- Prerequisites for treatment

## Treatment

- System setup
- Treatment delivery planning
- Treatment verification: conventional techniques
- Treatment verification: advanced techniques
- Image matching
- Image analysis
- Treatment delivery
- Respiratory gating treatment delivery
- SRS/SBRT treatment delivery

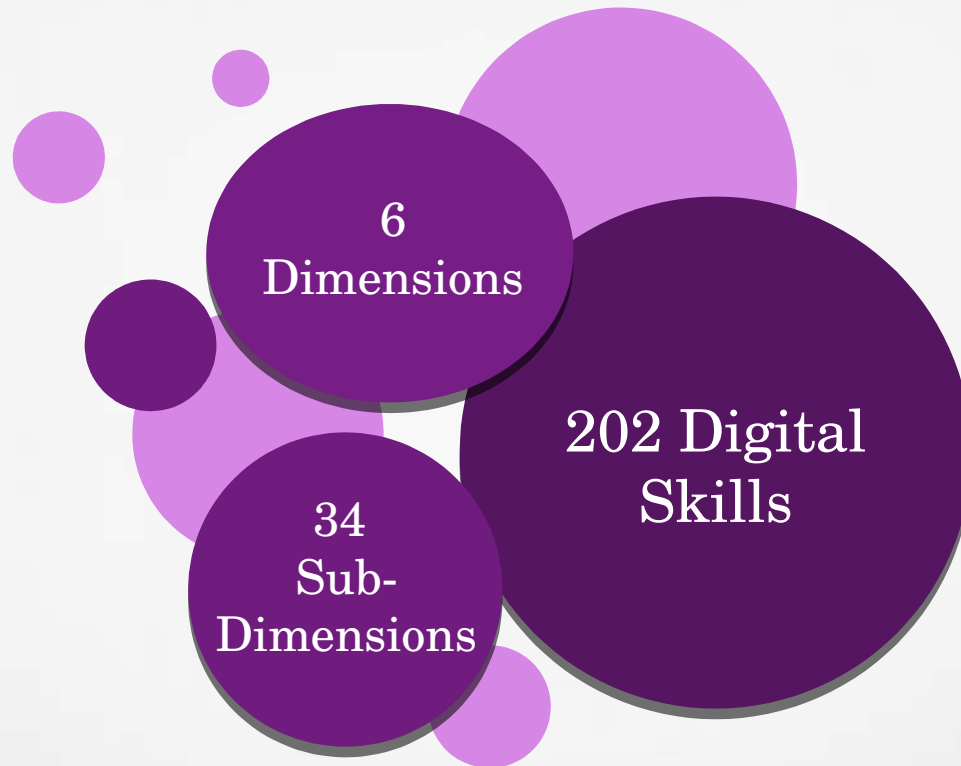
## Quality, Safety and Risk Management

- Quality assurance
- Security
- Risk management
- Data protection
- Information integrity

## Management and Research

- Department administration and management
- Education and research

# Results



# Results

<b>Transversal</b>	<b>Communication</b>	<ul style="list-style-type: none"><li>• Use an internal communication channel</li><li>• Create multimedia content for patient education</li></ul>
<b>Planning Image</b>	<b>Computerized Tomography</b>	<ul style="list-style-type: none"><li>• Create scan protocols</li><li>• Set acquisition parameters</li></ul>
<b>Treatment Planning</b>	<b>Dose Calculation</b>	<ul style="list-style-type: none"><li>• Select calculation parameters</li><li>• Calculate dose distribution</li></ul>
<b>Treatment</b>	<b>Image analysis</b>	<ul style="list-style-type: none"><li>• View online/offline images</li><li>• Use analysis tools</li></ul>
<b>Quality, Safety and Risk Management</b>	<b>Security</b>	<ul style="list-style-type: none"><li>• Record all procedures concerning the radiation delivered</li><li>• Review LINAC, MLC and imaging system failures/interlocks</li></ul>
<b>Management and Research</b>	<b>Education and research</b>	<ul style="list-style-type: none"><li>• Use data analysis software</li><li>• Create training programs</li></ul>



# Conclusions

- ✓ TRs need to deal with the digital revolution! Digital skills are already in use in daily practice!
- ✓ Ensure that TRs are trained with the necessary skills (from early education to CPD), to adopt the best practice across Europe.
- ✓ Closing the digital skills gaps will improve the quality of practice which will result in better patient outcomes.
- ✓ TRs must have a good level of digital skills, or risk losing autonomy and influence.
- ✓ Make TRs co-developers of digital solutions for Radiotherapy workflow.
- ✓ This set of digital skills will also allow for the anticipation of future needs, regarding the new technologies (such as machine learning, big data and cybersecurity).

# Future directions - WP7

- Survey distribution (Europe)
- Focus group interviews - design
- Recommendations and webinars

## 74. Indique o seu nível de desenvolvimento na realização das seguintes tarefas relativas à aquisição de imagens de verificação para tratamentos convencionais \*

MV - MegaVoltagem; KV - KiloVoltagem; 2D/3D/4D - 2, 3 e 4 dimensões, respectivamente; mA - miliampères; ms - milisegundos; CBCT - "Cone-beam Computed Tomography".  
Marcar apenas uma oval por linha.

	1 - Pouco desenvolvida	2	3	4	5 - Extremamente desenvolvida	Não sei
Adquirir imagens MV (2D e 3D/2D)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adquirir imagens KV (2D e 3D/2D)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Otimizar a qualidade das imagens KV (ex: ajustar KV, mA e ms)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adquirir imagens CBCT (3D-4D)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Definir parâmetros do CBCT (ex: modo, ângulo e espessura de corte)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adquirir topogramas e ajustar o "scan range"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Definir parâmetros de reconstrução (ex: volume, distância entre cortes e supressão de artefactos)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Realizar detecção de Marcadores (simétricos ou assimétricos)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## 75. Indique em que contexto acha que deveriam ser desenvolvidas as aptidões digitais referidas na questão anterior \*

CPD - "Continuous Professional Development"  
Marcar apenas uma oval.

- Formação académica base (bacharelato, licenciatura)
- Formação pós-graduada (ex: mestrado, doutoramento)
- CPD obrigatório (formações exigidas para a prática profissional e/ou pela entidade empregadora)
- CPD voluntário (formações não obrigatórias, estágio profissional)
- CPD informal (aptidões adquiridas na prática)
- Outro

## Aptidões Digitais dos Radioterapeutas - "Digital Skills of the Therapeutic Radiographers"

Caro participante,

O presente questionário enquadra-se no projecto "Safe and Free Exchange of EU Radiography Professionals across Europe – SAFE EUROPE" (grant agreement 2018-2993/001-001), ao abrigo do programa "Erasmus + Sector Skills Alliances" da União Europeia (UE).

O consórcio europeu deste projecto é representado pela Ulster University - UU (UK), University of Malta - UoM (MT), European Federation of Radiographer Societies - EFRS, Associação Portuguesa de Radioterapeutas - ART (PT), Instituto Português de Oncologia do Porto - IPOP (PT), Society of Medical Radiographers - SRM (MT) e Towarzystwo Naukowe Techników Medycznych Radioterapii - TNTMR (PL).

Esta investigação insere-se no "Work Package" 7 (WP7), designado por "Digital Skills for TRs", sendo liderado pela equipa do IPOP.

Objectivo:

O objectivo deste questionário é avaliar o nível de desenvolvimento das aptidões digitais, no exercício da Radioterapia, bem como os factores que o influenciam. Pretende-se também identificar quais as aptidões digitais emergentes e a(s) fase(s), mais adequadas, no percurso profissional, para a aquisição e desenvolvimento destas mesmas aptidões.

Metodologia:

Este questionário será aplicado a nível nacional nos seguintes países: Portugal, Malta, Reino Unido e Polónia (participantes no SAFE EUROPE).

Considerações éticas

A identidade dos participantes será mantida confidencial. Nenhuma informação que permita a identificação dos participantes será publicada.

Todos os dados recolhidos serão tratados de acordo com o Regulamento Geral de Protecção de Dados (UE) e analisados pelos investigadores do projecto SAFE EUROPE.

O questionário demorará aproximadamente 30 minutos a preencher. Pode sair do questionário em qualquer momento antes da sua submissão.

Desde já muito obrigado pela sua participação.

Caso tenha alguma questão por favor não hesite em contactar.

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# Conclusions



## Care Economy

### Emerging Jobs

- 1 Medical Transcriptionists
- 2 Physical Therapist Aides
- 3 Radiation Therapists
- 4 Athletic Trainers
- 5 Medical Equipment Preparers
- 6 Veterinary Assistants and Laboratory Animal Caretakers
- 6 Exercise Physiologists
- 8 Recreation Workers
- 8 Personal Care Aides
- 8 Respiratory Therapists
- 11 Medical Assistants
- 12 Fitness Trainers and Aerobics Instructors
- 13 Occupational Health and Safety Technicians
- 13 Orderlies
- 13 Healthcare Support Workers, All Other

### Top 10 Skills

- 1 Respiratory Therapy
- 2 Caregiving
- 3 Sterile Procedures / Techniques
- 4 Transcription
- 5 Radiation Treatment
- 6 Medical Dosimetry
- 7 Vital Signs Measurement
- 8 Simulation
- 9 Advanced Cardiac Life Support (ACLS)
- 10 Radiologic Technology

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 Rank    Scale of Opportunity:  Small-scale  Large-scale  
Skill Type:  Industry Specialized

A man in a dark suit and tie is shown from the chest up, pointing his right index finger upwards. The background is a dark blue, semi-transparent overlay featuring a world map on the left and various data visualization elements like bar charts and line graphs on the right. The text 'THANK YOU' is centered in a white, bold, sans-serif font within a white rectangular border.

**THANK YOU**

*“Digital skills require the mastery of particular relatively complex operations, interfaces, and applications of digital technology...Thus, digital skills are a complex policy problem that calls for both technological and educational solutions.”*

*Van Dijke, 2014*