

ÜLKEMİZDE VE DÜNYADA RTT DURUM DEĞERLENDİRMESİ

NADİR KÜÇÜK
Medikal Fizik Uzmanı

Özel Anadolu Sağlık Merkezi
22 Nisan 2019

BAŞLARKEN



Resim 41: Prof. A. Laugier I. Ulusal Radyasyon Onkolojisi Kongresi'nde dostlarıyla. (Soldan sağa; Doç. Dr. Murat Gürkaynak, Prof. L. Atahan, Prof. A. Laugier, Prof. B. Berkarda, Prof. M. Kınay.)



‘RT Teknikeri s ürecinin en önemli par çasıdır. Yapt ığımız mükemmel i şler ve tasar ımlar cihaz odas ında tekniker elinde gerçeğe dönüşür.’

BAŞLARKEN

- Nadir abi merhaba
- Merhaba
- Sana RTT kongresinde bir konuşma vermek istiyoruz kabul edersen.
- Tabiiki, memnuniyetle
- Abi konun şu: Ülkemizde ve Dünyada RTT durum değerlendirmesi
- Bu konuyu bir tekniker anlatsa daha iyi olmaz mı? Benim ağızımdan biraz eksik kalabilir.
- Olsun abi. Sen çok geziyorsun (Buraya fena takıldım ama belli etmedim, sunumda acısını çıkarırım). Dünyadaki durumu da görüyorsun. Sen toparla anlat bize.

İÇERİK

1. Teknikerin genel görevleri
2. Değişen teknolojiye genel bakış ve teknikerin pozisyonu
3. Teknolojik Tekniker (TekTek)
4. Dünyada RTT neler yapıyor?
5. Ülkemizdeki Durum Nedir?

RT teknikerin genel görevleri

1970

- ✓ Kalıp alma işlemi, blok yapımı
- ✓ Konv. simülasyon
- ✓ Hastaya pozisyon verme
- ✓ Tedavi cihazını kullanma
- ✓ Tedavide hastayı izleme
- ✓ Tedavi ile ilgili gerekli doküman ve evraklar hazırlamak ve doldurmak

2011

- ✓ Kalıp alma işlemi,MLC
- ✓ Konv. simülasyon
- ✓ Hastaya pozisyon verme
- ✓ IMRT, Vmat
- ✓ Tedavide hastayı izleme
- ✓ Tedavi ile ilgili gerekli doküman ve evraklar hazırlamak ve doldurmak

yenilik

- ✓ Radyocerrahi
- ✓ CT sim
- ✓ CBCT
- ✓ Robot
- ✓ Kamera
- ✓ MRI Linac
- ✓ Paperness yaklaşım,
- ✓ QA

RT teknikerin genel görevleri



Radiation Therapist Code of Ethics

- 1 The radiation therapist advances the principal objective of the profession to provide services to humanity with full respect for the dignity of mankind.
- 2 The radiation therapist delivers patient care and service unrestricted by concerns of personal attributes or the nature of the disease or illness, and without discrimination on the basis of sex, race, creed, religion or socioeconomic status.
- 3 The radiation therapist assesses situations; exercises care, discretion and judgment; assumes responsibility for professional decisions and acts in the best interest of the patient.
- 4 The radiation therapist adheres to the tenets and domains of the scope of practice for radiation therapists.
- 5 The radiation therapist actively engages in lifelong learning to maintain, improve and enhance professional competence and knowledge.

Profesyonellik

Adalet

Karar veren

Mesleki prensipler

Mesleki
gelişim



Değişen teknoloji genel bakış ve teknikerin pozisyonu



EUROPEAN COMMISSION

Directorate General Health and Consumer Protection - Europe Against Cancer Programme

Review of the European Core Curriculum for Radiotherapy Technologists

Agreement SI2.300737. This project received financial support from the Commission

Neither the European Commission nor any person acting on its behalf is liable for any use made of the following information

Değişen teknoloji genel bakış ve teknikerin pozisyonu

“RT’de teknolojik anlamda 3D tedavilerin başlamasıyla
her alanda teknolojik devrimler oldu”

- ✓ Görüntüleme ...
- ✓ TPS...
- ✓ Linac’lar...
- ✓ QA...

Değişen teknoloji genel bakış ve
teknikerin pozisyonu

Görüntüleme-Simülasyon

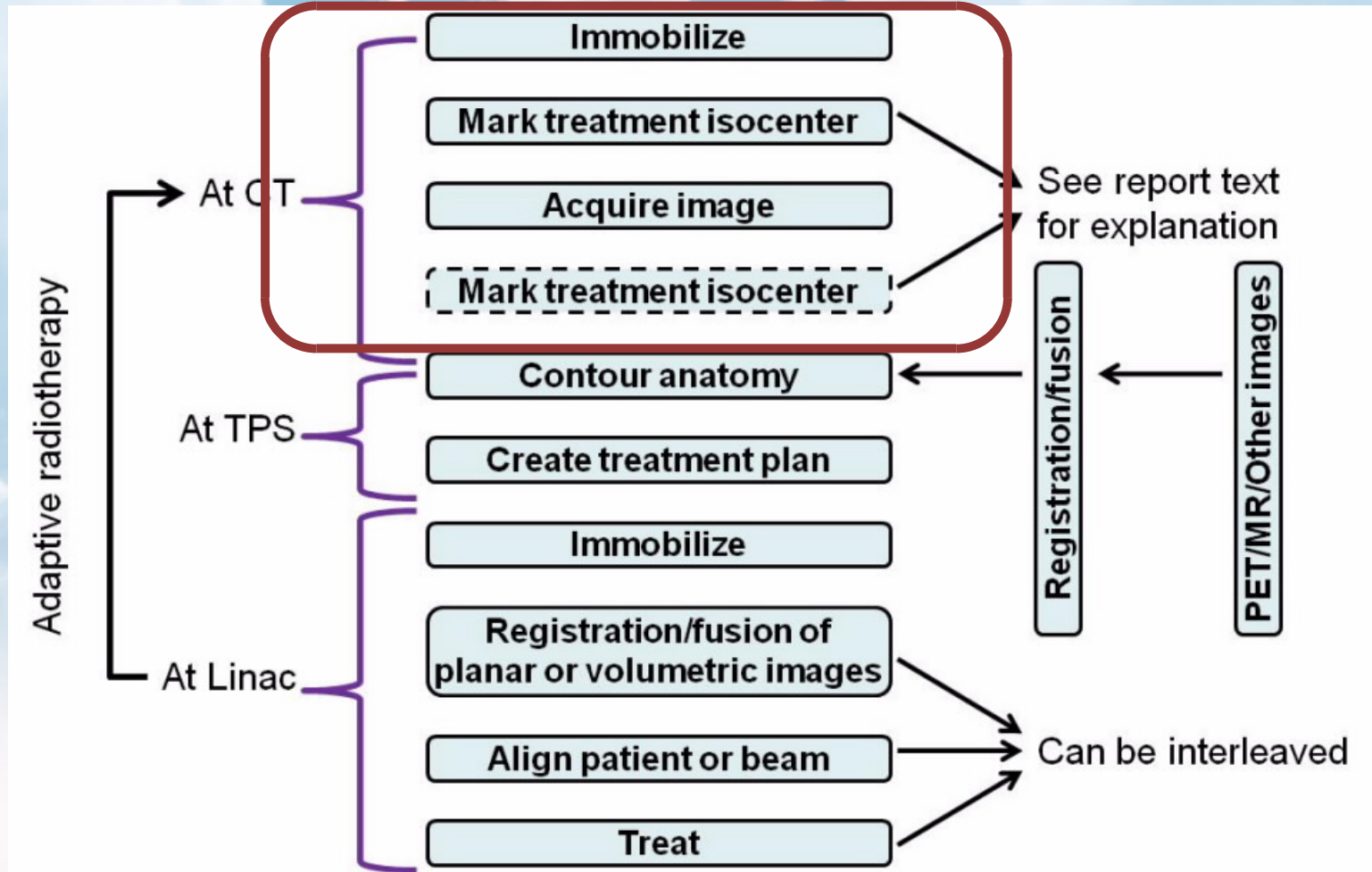


Figure 1. Workflow for CT-based radiotherapy.

Değişen teknoloji genel bakış ve
teknikerin pozisyonu

TPS

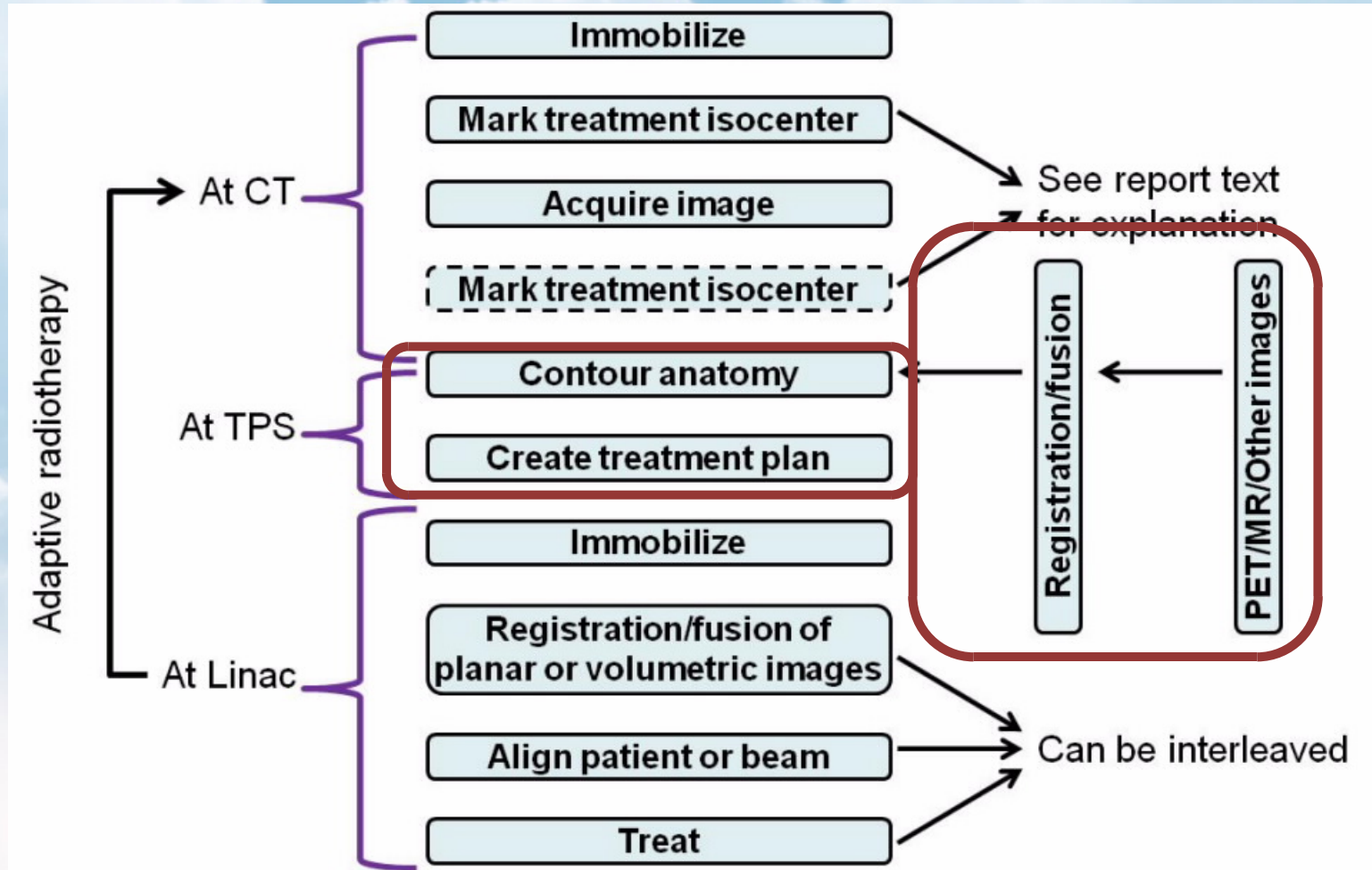


Figure 1. Workflow for CT-based radiotherapy.

TPS

Değişen teknoloji genel bakış ve
teknikerin pozisyonu

Dozimetriz



Radyasyon
Onkoloğu

Med.Fiz.

Dozimetriz yüzü

TPS

Dozimetrist

- ✓ CT,MR, PET, Anjio görüntüleri aktarılması
- ✓ Füzyon
- ✓ Konturlama
- ✓ Işın yerleşimi
- ✓ Optimum plan oluşturma
- ✓ Değerlendirme

Değişen teknoloji genel bakış ve teknikerin pozisyonu

LINAC

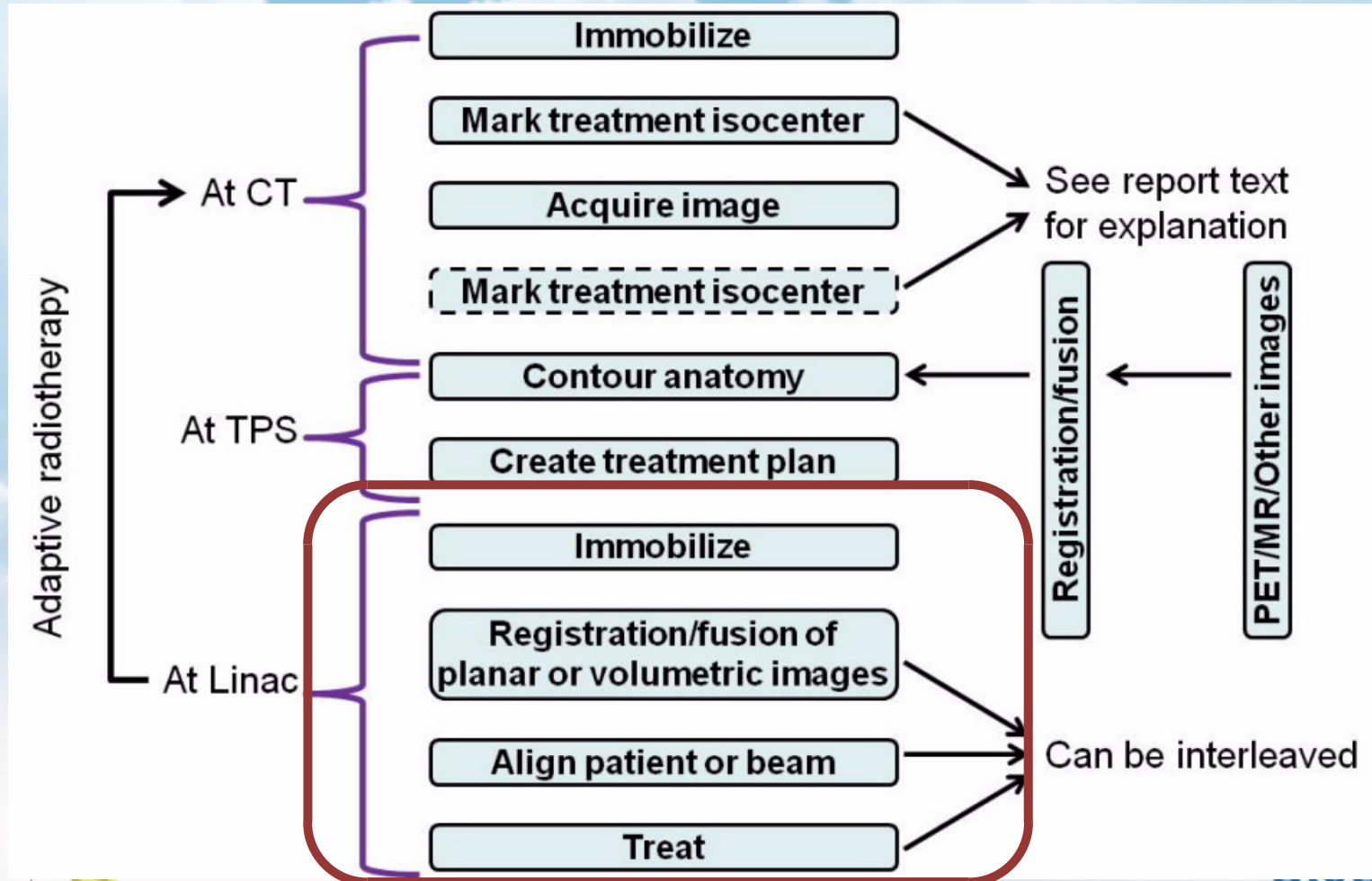


Figure 1. Workflow for CT-based radiotherapy.

LINAC



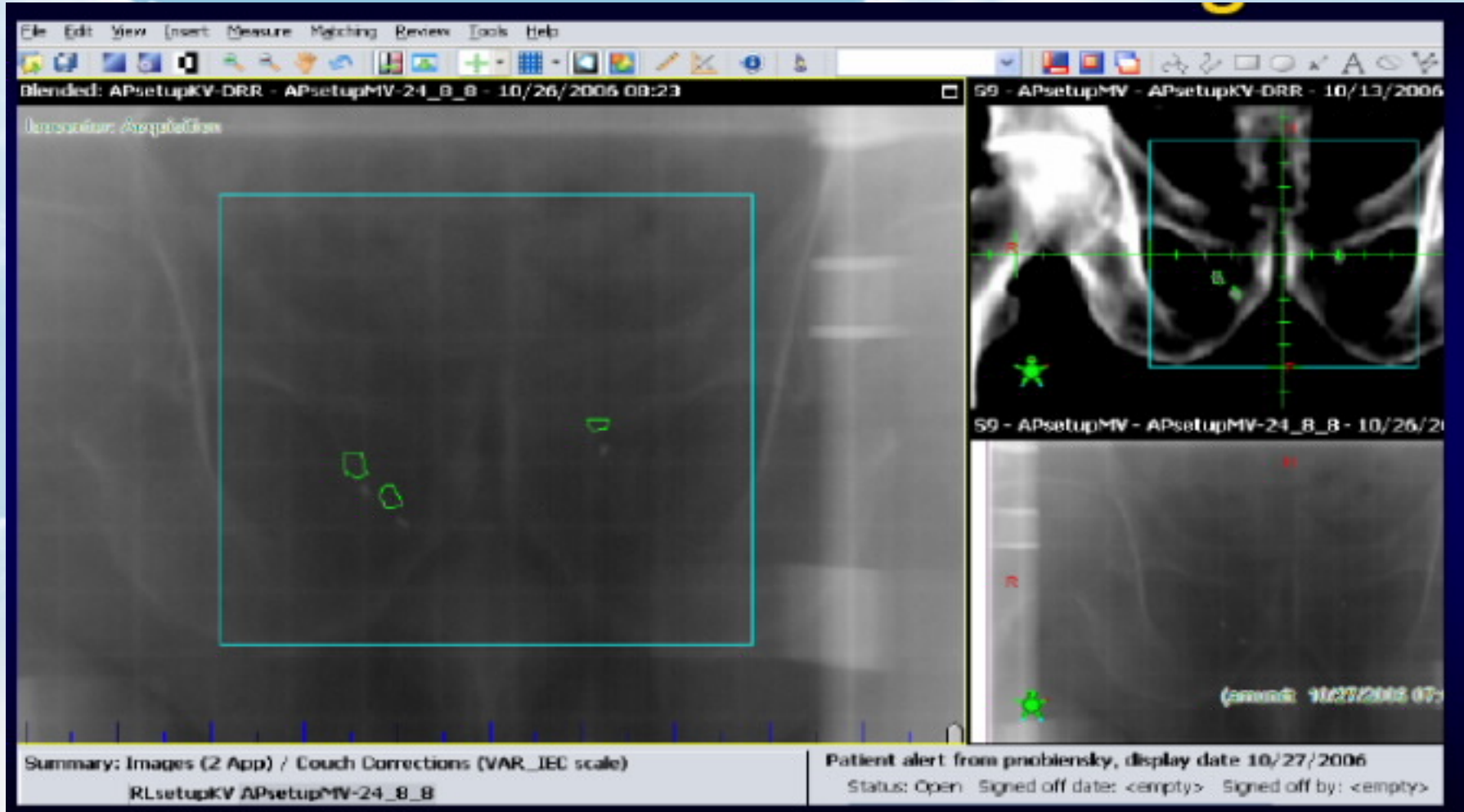
Linear accelerator with MLC and Portal vision

Değişen teknoloji genel bakış ve
teknikerin pozisyonu

LINAC



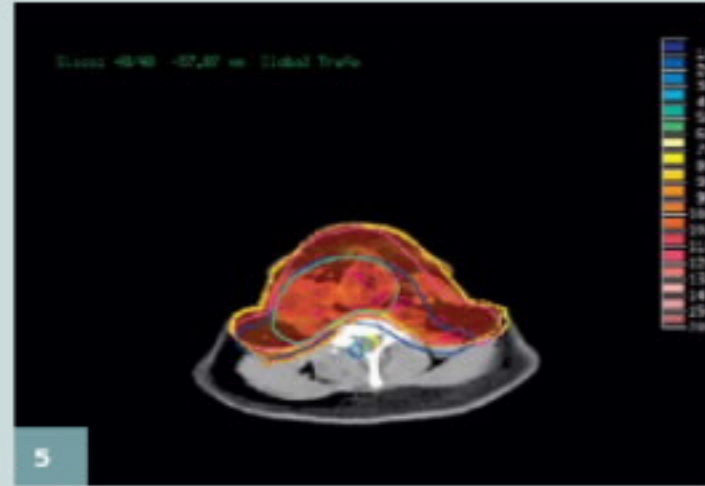
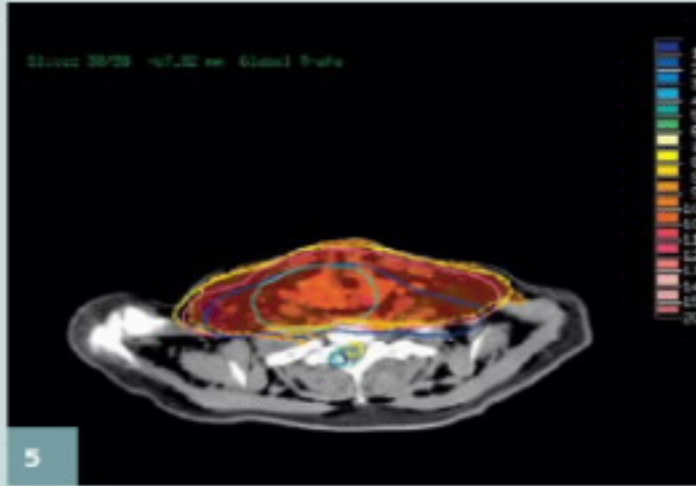
LINAC



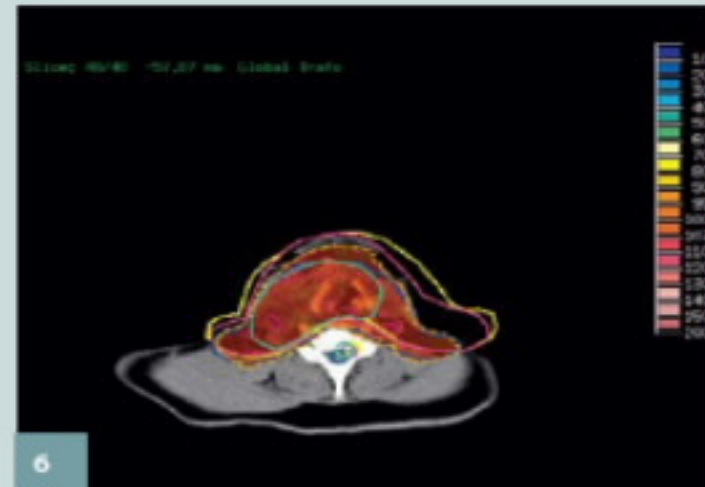
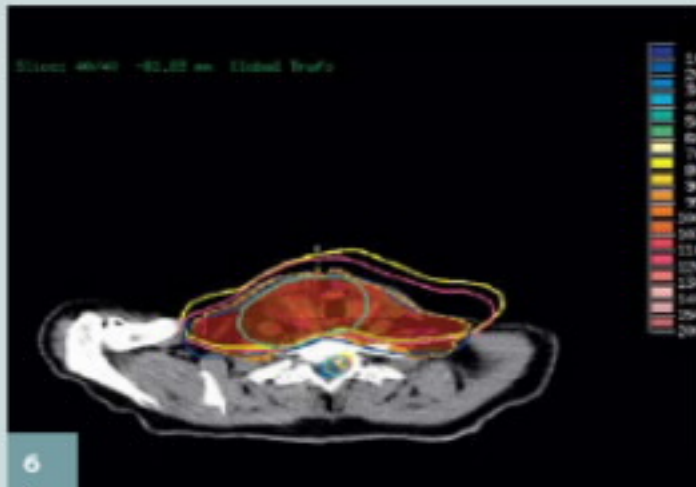
Markır Eşleştirme

LINAC

MVCT/CBCT/kvCT



Orijinal
plan



Kilo
kaybı
sonrası

LINAC

QA

- Günlük linac ölçümleri
- Görüntüleme sistemi günlük QA
- Hasta spesifik QA

LINAC

TEKNİKER NE YAPIYOR?

HİÇBİRŞEY

HERŞEY

TEKNOLOJİK TEKNİKER (TEK TEK)

- Modern tedavi modelitelerinin felsefesini bilen
- Bilgisayar bilgisi iyi olan
- Araştırmacı ve sorgulayıcı
- Karşılaştırma ve yorumlama yapabilen
- Mesleğinin önemini ve etik kurallarını bilen

DÜNYADA RTT DURUMU-USA

Astro Tanımı

4. Radiation Therapists and Simulation Staff

Radiation therapists and simulation staff should fulfill state licensing requirements. Radiation therapists should be certified in radiation therapy by the American Registry of Radiologic Technologists (ARRT), or be eligible for such certification. Simulation staff should be certified by ARRT in either radiation therapy or diagnostic imaging, or eligible for such certification.

5. Dosimetrist

Medical dosimetrists should be certified in medical dosimetry by the Medical Dosimetrist Certification Board (MDCB), or be eligible for such certification.

ACR-ASTRO PRACTICE PARAMETER FOR RADIATION ONCOLOGY-2018

DÜNYADA RTT DURUMU-USA

ARRT



ABOUT - VERIFY CREDENTIALS SANCTIONED LIST

ABOUT THE PROFESSION ▼
Considering a career?

EARN ARRT CREDENTIALS ▼
Learn About the Process

PARTNERS ▼
Working with ARRT

EARN ARRT CREDENTIALS

Credential Options

Initial Requirements

Ongoing Requirements

How to Apply

RADIATION THERAPY

Working as a Radiation Therapist

Radiologists and radiation oncologists often prescribe radiation therapy for patients who have cancer or other serious diseases. As a radiation therapist, you'll be part of the team that helps plan and administers these treatments, and monitors patients' conditions. You'll use special equipment that produces ionizing radiation to administer therapeutic doses of radiation.

Part of your job may also be to provide support to nervous patients. Dealing with a serious disease is usually a challenging and frightening experience. Having a skilled and caring radiation therapist can often make a great deal of difference.



DÜNYADA RTT DURUMU-USA



Description of the Medical Dosimetrist

The Medical Dosimetrist is a member of the radiation oncology team working in collaboration with the medical physicist and radiation oncologist. Through knowledge of radiation oncology treatment machines and equipment and application of principles of physics, anatomy and radiobiology, the dosimetrist generates life-saving radiation therapy treatment plans.

Examination Session

April 4th – April 6th, 2019

Applications Welcomed

November 5th, 2018 – January 21st, 2019

Route 1 Eligibility Criteria

- First-time certification candidates must be graduates of a USA Joint Review Committee on Education in Radiologic Technology (JRCERT) accredited Dosimetry program of at least twelve (12) months and hold a Bachelor's degree. A copy of the **official diploma** and its corresponding **official transcript** from the JRCERT accredited Dosimetry program must be submitted. For applicants who have completed a certificate program, in addition to the JRCERT program official diploma, an **official Bachelor's degree diploma** must be provided. The name on these documents must match the name on the application or an official name change decree must accompany your application.

DÜNYADA RTT DURUMU-USA

MDCB

International Eligibility Criteria

- Graduation from a Non-U.S. academic program with a Bachelor of Science degree in Radiation Therapy, Radiation Science or Radiography.
- A minimum grade of C or 70-79% in Anatomy and/or Physiology, Brachytherapy, Clinical Lab, Computer Technology, Cross-sectional Anatomy, Radiation Oncology, Radiation Physics, Radiobiology and Treatment Planning.
- Completion of 1,000 clinical curriculum hours in Medical Dosimetry treatment planning during Bachelor of Science degree (or higher) course of study.

Only candidates practicing outside the U.S. should apply as an international candidate. Individuals with non-US degrees practicing in the US must apply as Route 1 candidates. It is the responsibility of the candidate to submit all required documentation in English and to demonstrate "foreign equivalency" of the related science degree submitted by providing documentation from **only** one of the following organizations recognized by the MDCB: **The Foundation for International Services, Inc. (FIS), OR the International Education Research Foundation (IERF)**. All documentation that is reviewed by the FIS or IERF must be evaluated on a "course-by-course" basis. Foreign equivalency documentation from any other organization will not be considered. Canadian applicants will not be required to submit foreign equivalency evaluation.

Please note: Beginning in 2022, international candidacy eligibility will be eliminated.

DÜNYADA RTT DURUMU

MDCB

MDCB Test Specifications Matrix Derived from the 2018 Job Task Analysis	
Domain	Weight
I. Radiation Physics	16%
1. Radioactive decay	
2. Production of X rays and particle beams	
3. Characteristics of X rays and particle beams	
4. Interaction of radiation with matter	
5. Treatment machine characteristics: (e.g., UNAC, MR, proton, photon, orthovoltage and superficial X rays, gamma source)	
6. Geometric characteristics (e.g., magnification, minification)	
7. Radiation measurement	
8. Imaging modalities (e.g., MRI, PET, CT, ultrasound, SPECT, KV/MV, CBCT)	
9. Hounsfield unit conversion to CT density table in treatment planning systems	
10. Radiation units (e.g., activity, exposure, absorbed dose, and dose equivalent)	
II. Localization	8%
1. Acquisition of patient data	
2. Patient positioning	
3. Patient immobilization and motion management techniques	
4. Treatment simulations, TPS localization of patient	
5. Rigid image registration, deformable registration, image fusion	
6. IGRT (e.g., SGRT, CBCT, ultrasound guidance, KV-KV, MV-MV, infrared, fluoroscopy, CT on rails, fiducials)	
III. Treatment Planning	40%
1. Isodose distributions and dose metrics	
2. Site specific clinical oncology (e.g., disease, anatomy, modes of spread, common treatment techniques, dose and fractionation schemes)	
3. Radiobiology (e.g., dose tolerances, hypofractionation, time dose fractionation calculation, BED, RBE, LET)	
4. Cross-sectional anatomy	
5. Treatment delivery systems machine differences, limitations, and advantages	
6. Special treatment procedures (e.g., TBI, TSE/TBE, IORT, SRS, SBRT)	
7. Planning methodologies (e.g., forward, inverse, compensator, robust planning)	
8. DICOM data transfer	
9. Computer systems management (e.g., archiving and backup, routine maintenance, scripting)	
10. Adaptive radiotherapy	
11. Autoplanning	
12. Autocontouring	
13. Implanted devices	
14. The accuracy and limitations of IGRT techniques	

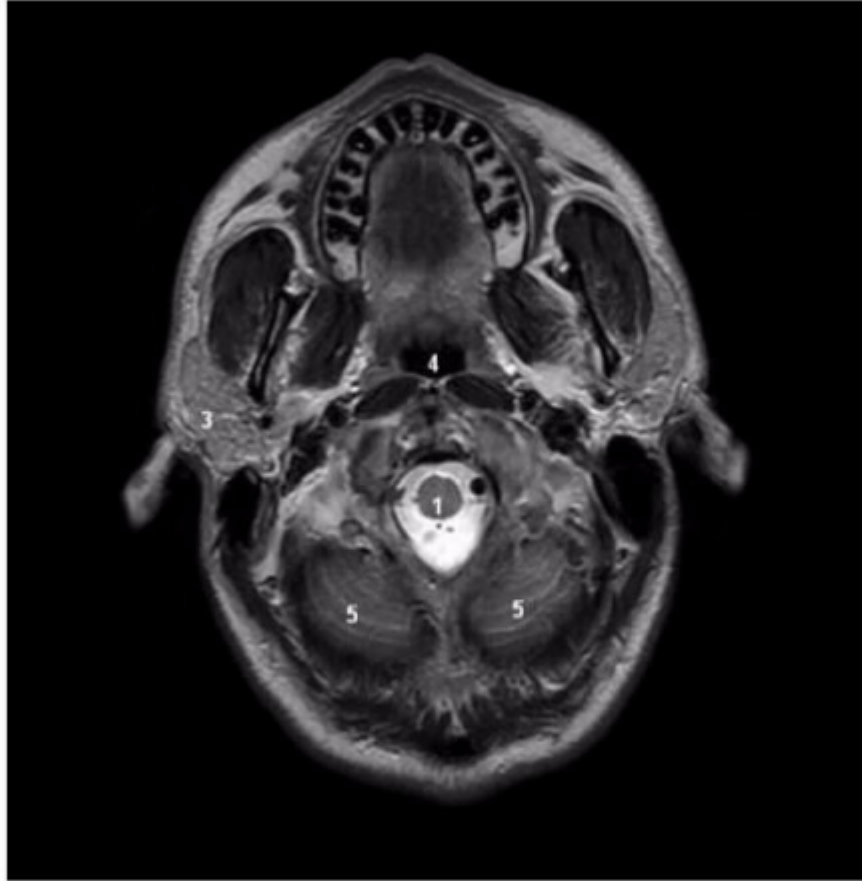
IV. Dose Calculation Methods	15%
1. External beam dose calculation and algorithms	
2. Effects of beam modifying devices (e.g., wedges, bolus, partial transmission blocks, compensators, MLC)	
3. Special calculations (e.g., off axis, re-treatments, gap calculations, entrance/exit dose)	
4. Corrections for tissue inhomogeneities and density overrides	
5. Deformable dose accumulations	
6. Sources of uncertainty and limitations in computer-based treatment planning (e.g., effects of dose grid matrices)	
V. Brachytherapy	6%
1. Radioactive source characteristics	
2. HDR and LDR treatment planning	
3. HDR and LDR delivery systems	
4. Brachytherapy treatment device verification (e.g., seeds applicators)	
5. Secondary/independent calculation	
6. Surveying (e.g., background pre and post implant, shielding, bedside dose)	
7. Regulatory requirements for radioactive sources (e.g., NRC vs state requirements)	
VI. Radiation Protection	7%
1. ALARA and maximum permissible dose equivalent based on NCRP recommendations, regulatory guidelines (e.g., ICRU, NCRP)	
2. Radiation monitoring for personnel and patients	
3. Treatment vault shielding requirements	
VII. Quality Assurance and Standard of Care	8%
1. TPS commissioning and quality assurance	
2. Clinical data: plan checks, chart reviews, image reviews	
3. Measurement equipment (e.g., diodes, ion chambers, TLD, survey meters)	
4. Record and verify systems and EMR	
5. Treatment beam QA measurement and analysis (e.g., IMRT, electron cut out factors)	
6. AAMD Scope of Practice	
7. Incident reporting for patient safety (e.g., quality improvement, RO-ILS, root cause analysis, process improvement)	
8. Factors and limitations of deliverable plans	
9. QA requirements of simulation and treatment equipment	

5. Based on clinical experience with total body irradiation (TBI) before bone marrow transplantation and hemibody irradiation, the most important dose-limiting tissue is the:

- A. lens of the eye.
- B. spinal cord.
- C. lung.
- D. skin.

DÜNYADA RTT DURUMU-USA

MDCB-Soru Örnekleri



1

3

4

5

cerebellum

parotid gland

cervical
spinal cord

oropharynx

DÜNYADA RTT DURUMU-AVRUPA

ESTRO

- **Tanım:** Radyoterapi teknikerleri, multi-disipliner ekibin bir parçası olarak kanser hastalarının tedaviye hazırlanmasından ve radyoterapi tedavisinin hastaya verilmesinden sorumlu olan profesyonellerden oluşan bir gruptur.
- **Kapsamı:** Reçete edilen radyasyon dozunun güvenli ve doğru bir şekilde hastaya verilmesini ve tedavi hazırlama, tedavi ve hemen tedavi sonrası aşamalar boyunca hastanın klinik bakımını ve desteğini günlük olarak sağlanması olarak açıklamıştır.

DÜNYADA RTT DURUMU-AVRUPA

ESTRO

- **Unvan:** Avrupa'da ve dünyada bu mesleği tanımlayan tek bir başlık yoktur.
- **Radiation Therapist**
- **Radiation Technologist**
- **Therapeutic Radiographer**
- ESTRO ve IAEA tarafından bu meslek grubunu tanımlamak için **RTT** kullanılmaktadır.
- **Eğitim:** Orta öğretim sonrası 2-3-4 yıl üniversite eğitimi

DÜNYADA RTT DURUMU-AVRUPA

ESTRO



European Higher Education Area
Level 6

Benchmarking document
for Radiation Therapists

DÜNYADA RTT DURUMU-AVRUPA

ESTRO

- Profesyonelizm
- Meslekten ve diğer mesleklerden kişiler ile iletişim
- Görüntü alımı ve sanal simülasyon
- Tedavi Planlama
- Tedavi verifikasyonu
- Tedavinin verilmesi
- QA
- Brakiterapi
- Araştırma
- Eğitim

DÜNYADA RTT DURUMU-AVRUPA

ESTRO

Country	Title
Austria	Radiologietechnologe (from 2005)
Belgium	Verpleegkundige Radiotherapie – Verpleegkundige Infirmier en Radiothérapie Nurse specialized in oncology from 18th February 2009 (Recognised by a Ministerial Order)
Bulgaria	X-ray technician
Croatia	Baccalaureus of Radiation Technology / Medical Radiology Engineer
Cyprus	Therapeutic Radiographer
Denmark	Stråleterapeut
Estonia	Radioloogiatehnik Radioloogialõde
Finland	Röntgenhoitaja
France	Manipulateur (trice) d'électro-radiologie médicale en radiothérapie
Hungary	Röntgenasszisztens Radiografus
Ireland	Radiation Therapist
Italy	Tecnico Sanitario di Radiologia Medica
Lithuania	Radiologijos technologas-radiology technologist
Macedonia	Radiation Technologist
Malta	Therapy Radiographer
The Netherlands	Medisch Beeldvormings-en Bestralingsdeskundige (MBB'er) Radiotherapeutisch Laborant Radiation Therapist
Norway	Stråleterapeut in Norwegian i.e. Radiation Therapist
Poland	Technik radioterapii
Portugal	Técnico de Radioterapia
Serbia	Strukovni medicinski radiolog – Medical Radiologist of Applied Sciences
Slovenia	Diplomirani inženir radiološke tehnologije
Spain	Radioterapia
Sweden	Onkologisjukskötarska med specialistutbildning radioterapi Sjukskötarska med specialistutbildning radioterapi
Switzerland	Technicien en radiologie médicale
Turkey	Radiotherapist / Radiotherapy technologist
United Kingdom	Therapeutic radiographer / Radiographer
Russia	
Slovakia	
Spain	Técnico superior especialista en RT
United Kingdom	Therapeutic Radiographer Therapy Radiographer Radiographer Radiotherapist

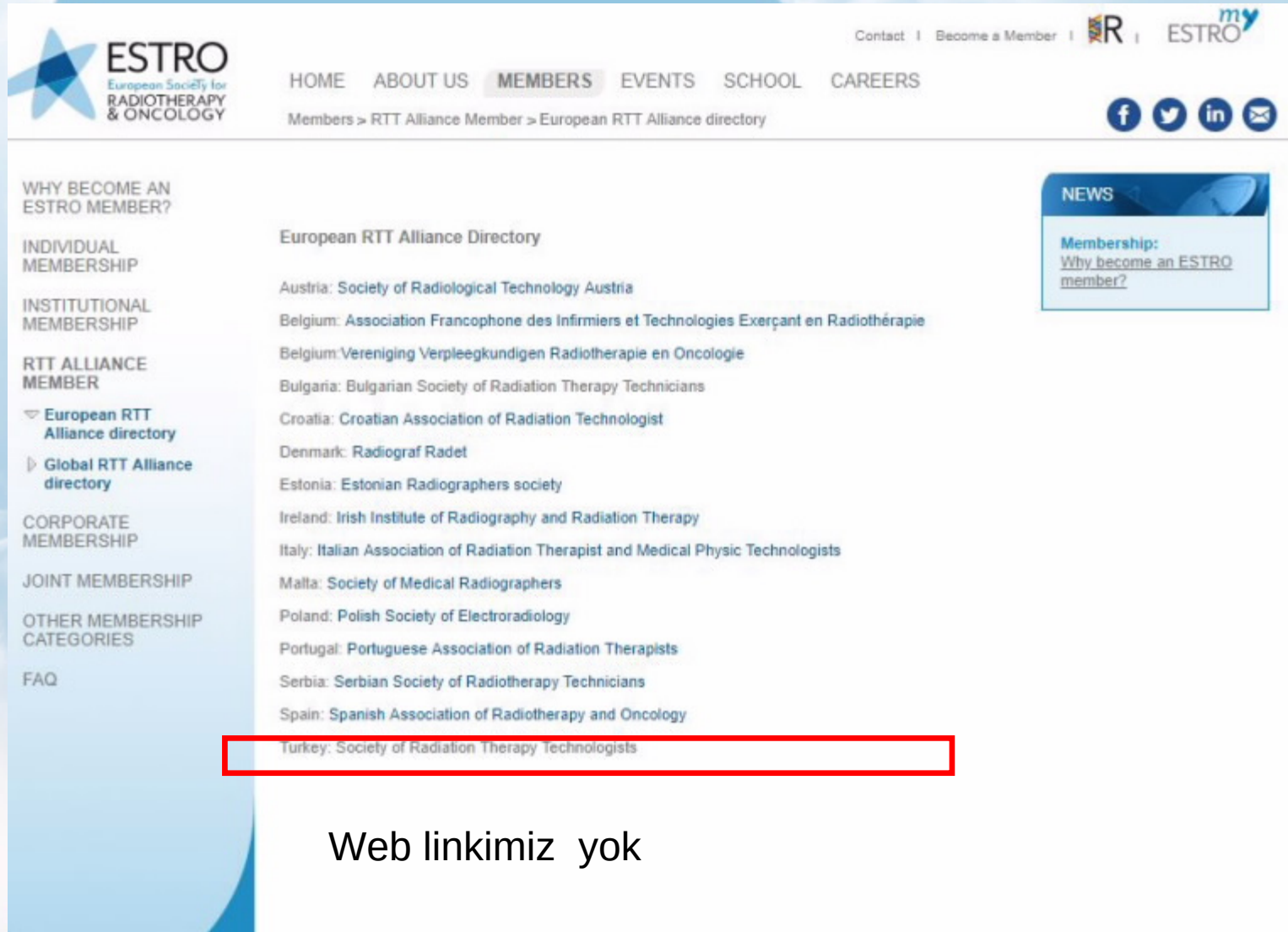
DÜNYADA RTT DURUMU-AVRUPA

ESTRO

Anket

TREATMENT								
	Always	Single Field	2D	3D	4D	IMRT	TBI	Stereotactic
Are all first set ups checked by a clinician?								
Does the clinician have to approve all set ups?								
Does the physicist have to be present?								
Are the treatment charts completed and signed daily by the RTT?								
Can the RTT check the on line set up verification images?								
Can the RTT approve the on line set up verification images?								
Can the RTT check the off line set up verification images?								
Can the RTT approve the off line set up verification images?								
Can the RTT carry out the placement of the in vivo dosimetry devices?								
Can the RTT carry out the in vivo dosimetry analysis?								
PATIENT PSYCHOSOCIAL AND CARE PROCEDURES								
	Yes	No	Comment					
Does the RTT monitor the daily side effects experienced by the patient?								
Can the RTT discuss the patient's side effects with them?								
Can the RTT manage the patient's side effects?								

DÜNYADA RTT DURUMU-AVRUPA ESTRO



ESTRO
European Society for
RADIO THERAPY
& ONCOLOGY

Contact | Become a Member | **my** ESTRO

HOME ABOUT US **MEMBERS** EVENTS SCHOOL CAREERS

Members > RTT Alliance Member > European RTT Alliance directory

WHY BECOME AN ESTRO MEMBER?

INDIVIDUAL MEMBERSHIP

INSTITUTIONAL MEMBERSHIP

RTT ALLIANCE MEMBER

European RTT Alliance directory

Global RTT Alliance directory

CORPORATE MEMBERSHIP

JOINT MEMBERSHIP

OTHER MEMBERSHIP CATEGORIES

FAQ

European RTT Alliance Directory

Austria: Society of Radiological Technology Austria

Belgium: Association Francophone des Infirmiers et Technologies Exerçant en Radiothérapie

Belgium: Vereniging Verpleegkundigen Radiotherapie en Oncologie

Bulgaria: Bulgarian Society of Radiation Therapy Technicians

Croatia: Croatian Association of Radiation Technologist

Denmark: Radiograf Radet

Estonia: Estonian Radiographers society

Ireland: Irish Institute of Radiography and Radiation Therapy

Italy: Italian Association of Radiation Therapist and Medical Physic Technologists

Malta: Society of Medical Radiographers

Poland: Polish Society of Electroradiology

Portugal: Portuguese Association of Radiation Therapists

Serbia: Serbian Society of Radiotherapy Technicians

Spain: Spanish Association of Radiotherapy and Oncology

Turkey: Society of Radiation Therapy Technologists

NEWS

Membership:
[Why become an ESTRO member?](#)

Web linkimiz yok

DÜNYADA RTT DURUMU-AVRUPA

ESTRO-RTT Komitesi

RTT (RADIATION THERAPIST) COMMITTEE

Purpose

The RTT Committee of ESTRO was established in 1993 to address the professional issues and needs of RTTs. RTTs plan and deliver the radiotherapy to the patients as well as providing side effect management and psychosocial care to the patients as part of the multidisciplinary team.

The ESTRO RTT Committee represents RTTs at an European level. ESTRO is dedicated to specific needs of RTTs and views the profession of RTTs as a distinct profession in its own right.

The RTT Committee meets regularly through web meetings as well as face-to-face twice a year to discuss issues relevant to the work of RTTs in Europe and to find and implement means to advance the profession and raise the standard of care to our patients.

The terms of reference of the RTT Committee are to:

- Raise the professional profile of RTTs
- Facilitate the development of continuing education
- Create networks with other RTTs in Europe and worldwide to exchange knowledge, views and ideas
- Interact with clinicians, physicists and radiobiologists and provide synergy in the multidisciplinary approach to the treatment of cancer
- Encourage an increased understanding of the scientific basis of our profession and to learn about new techniques and attitudes

Work of the RTT Committee

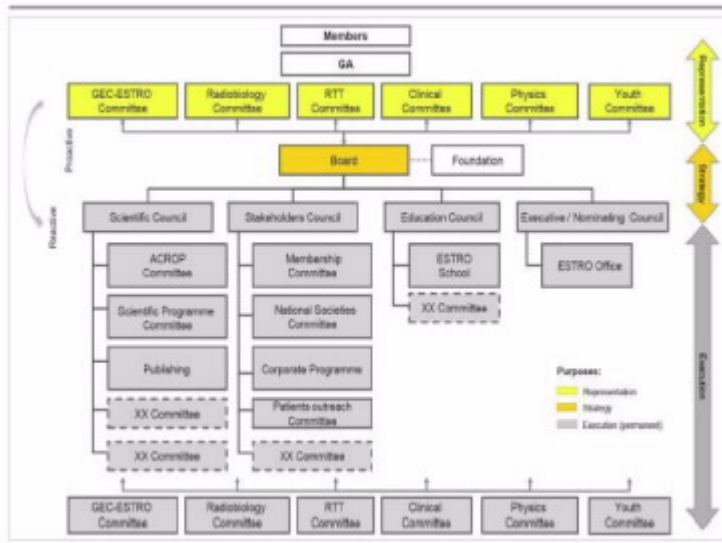
The committee has been instrumental in ensuring that RTTs are properly represented across a broad range of ESTRO activities and that their role in patient care is fully understood. RTTs are now represented on the Education & Training Committee, ESTRO Board and Scientific Council. The work of the committee can be categorised under four main areas:

- Education
- Research dissemination
- Professional issues
- Outreach

For more details on the RTT Committee's activities follow this link. >

Members

To view profiles click on pictures



DÜNYADA RTT DURUMU-AVRUPA

ESTRO-RTT Komitesi

ETİK DEĞERLER

1. Saygı
2. Kıymet verme
3. Mükemmel İlgi
4. İnsan Hakları
5. Hasta İmtiyazları
6. Doğruluk
7. Merhamet
8. Tolerance
9. Adalet
10. Topluluk aidiyatı
11. Bütünlük

Core Ethical Principles for Good Practice

The RTT must advocate for and demonstrate ethical principles in clinical practice and research, at all times. Listed below are the core ethical principles for good practice. In the daily practice of an RTT, these core principles may conflict, this conflict should be addressed through ethical reasoning.

The core ethical principles required of an RTT include the following:

1. **Respect:** The RTT should respect patients as persons.
2. **Dignity:** The RTT should treat all persons with dignity.
3. **Best interests:** The RTT should act in the best interests of patients even when their interests conflict with their own.
4. **Human rights:** The RTT should recognise and respect the human rights of all persons.
5. **Patient Autonomy:** The RTT should honour the right of patients to make informed choices and to behave in line with their own beliefs and values.
6. **Truthfulness:** The RTT should act truthfully in their dealings with patients.
7. **Compassion:** The RTT should empathise and be sensitive to, and with, patients and provide comfort and support, where appropriate.
8. **Tolerance:** The RTT should respect the rights of patients to have different beliefs and values.
9. **Justice:** The RTT should treat all individuals in an impartial, fair and just manner.
10. **Community:** The RTT should strive to contribute to society in line with their professional abilities and standing in the community.
11. **Integrity:** The RTT should incorporate these core ethical principles as the basis for their character and practice.

DÜNYADA RTT DURUMU-AVRUPA

ESTRO-RTT Komitesi

Radiation Therapist (RTT) Committee

Strategic Vision 2016-2021



ESTRO Vision	Current Activity	ESTRO Governance Strand and International Collaborations	RTTC Future Vision
Vision 1.2, 1.3 and 1.5	- The Core Curriculum and EQF 6 Benchmarking documents for RTTs address undergraduate education programmes underpinning best practice for new graduates. - The Best Practice in Radiation Oncology: A Project to Train RTT Trainers (TTT). - Blended Learning - An RTT is a member of the FALCON group. - Two RTTs are FALCON tutors - RTTs are involved in the preparation of EGLOS for DOVE - EAGLE, as a virtual learning environment, is used exclusively on TTT Project - Live Courses. RTTs contribute as faculty members on the following live courses: - Basic treatment planning - Advanced skills in modern radiotherapy - Multidisciplinary management of breast cancer - Upper GI: Technical and clinical challenges for the radiation oncologist - Clinical practice and implementation of image-guided stereotactic body	Education	
		- Education Council and National Societies - In collaboration with the IAEA - Education Council - Education Council	1a. Continued dissemination of the core curriculum and EQF 6 benchmarking documents 1b. Revision of these documents to ensure consistency with future practice 1c. The development of additional supporting documents such as the EQF 7 and 8 and the professional profile 2a. To further raise the standard of the short courses delivered by the participants on the TTT projects 2b. To influence the national education programmes for RTTs to increase the focus on radiotherapy 2c. To influence at national government and EU level for the recognition of the profession of RTT 3a. RTT Committee Chair is leading the blended learning pillar of the Education Council 3b. Positioning and Immobilisation for

DÜNYADA RTT DURUMU-AVRUPA

ESTRO-RTT Komitesi

GUIDELINES FOR POSITIONING, IMMOBILISATION AND POSITION VERIFICATION OF HEAD AND NECK PATIENTS FOR RTTs

Edited by:
Michelle Leech

Michelle Leech

Mary Coffey
Mirjam Mast
Filipe Moura
Andreas Oszlavics
Danilo Pasini
Aude Vaandering

DÜNYADA RTT DURUMU-AVRUPA

ESTRO-RTT Komitesi: Estro RTT Bülteni



“This Corner
focuses on advanced
practice and
education”

Welcome to the RTT Corner.

So far, 2018 has been a very interesting year for the implementation of new technologies in radiation oncology. Radiation therapists (RTTs) play a fundamental role, not only in the planning and treatment management of patients, but also in the implementation of advanced practice. In order to further increase our autonomy and professional responsibilities, we must provide high-level education that enables and motivates RTTs to perform at an even higher standard. As such, this Corner focuses on advanced practice and education.

Recently, RTT Corner committee and board member Laura Mullaney co-authored a publication in *Clinical and Translational Radiation Oncology* (ctRO). The original research article, 'Learning in radiation oncology: results of the ESTRO multidisciplinary survey', discusses the importance of the ESTRO School's educational role for young professionals. In this Corner, we have invited Laura to answer questions about the importance of the ESTRO School, education for RTTs and our profession.

RTT Guilherme Couto is an assistant lecturer at the University of Malta, and finished his MSc in Medical Physics at Faculdade de Ciências do Porto,

Portugal. He is currently reading for a PhD at Ulster University in Northern Ireland, UK, where he is focusing on the development of RTT competencies, practising on the linear accelerator. In February this year, Guilherme had an article published in Radiotherapy on the 'Evaluation of the educational requirements to practice radiography in the European Union', emphasising the need for further professional regulation in the EU. We have published a review of this article here.

Our final piece is written by Aoife Williamson, RTT neuro-oncology specialist working at the Beatson West of Scotland Cancer Centre (BWOSCC) in the UK. Aoife has developed this role over the past ten years and has completed an MSc in 'Advanced practice in radiotherapy and oncology' at Sheffield Hallam University, UK, in 2013. In this Corner, Aoife shares her broad experience in technical advances, patient care and quality assurance (QA) within her specialist role.

We hope you enjoy reading this Corner. If you have any interesting ideas or suggestions for articles, please do not hesitate to contact us.

Aileen Duffton, Isabel Lobato and Ilija Ćurić



AILEEN DUFFTON



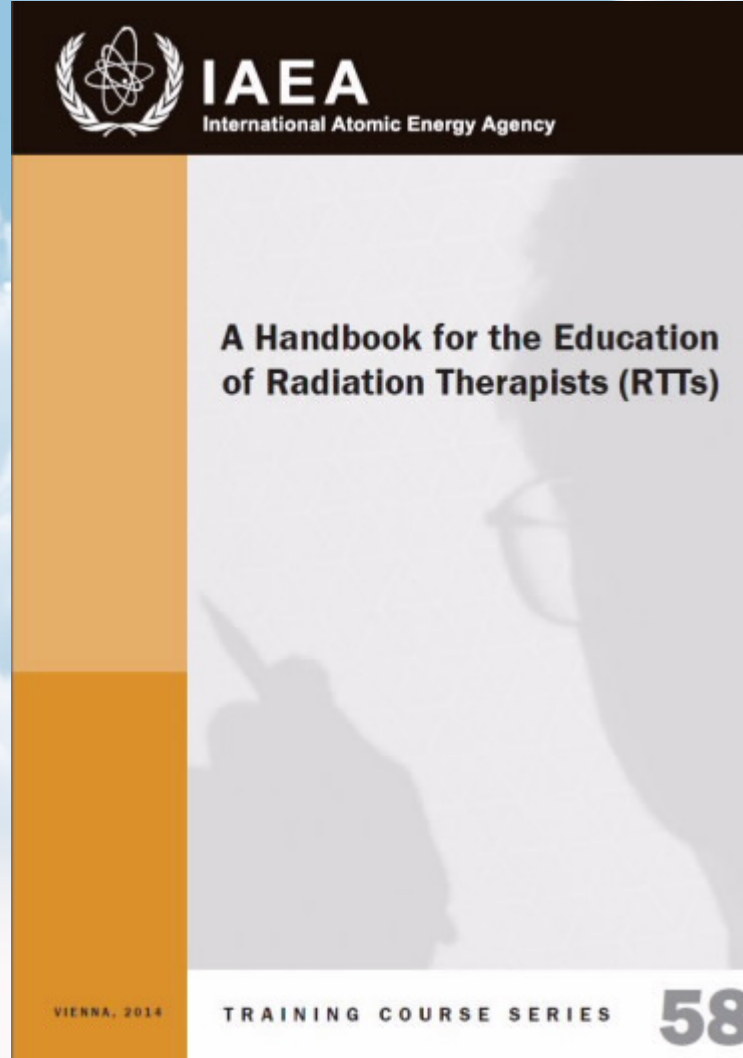
ISABEL LOBATO



ILIJA ĆURIĆ

DÜNYADA RTT DURUMU

IAEA



DÜNYADA RTT DURUMU-AVUSTRALYA



Australian Society of Medical Imaging and Radiation Therapy

The national professional organisation representing medical radiation practitioners

ABN 26 924 779 836

Radiation Therapist Scope of Practice

There are core clinical responsibilities identifiable within the modern day contemporary radiation therapist role. These span a unique and diverse range of responsibilities in their daily role, including;

- Inter and Intra professional communication
- Professionalism
- Patient Care and Advocacy
- Patient Positioning and Immobilisation
- Radiation Biology and Physics
- Image Acquisition and Interpretation
- Simulation / Localisation
- Treatment Planning
- On treatment Verification
- External Beam Treatment Delivery
- Brachytherapy
- Quality Assurance
- Research and clinical practice improvement
- Education

DÜNYADA RTT DURUMU-RUSYA

Technical Innovations & Patient Support in Radiation Oncology 8 (2018) 15–16



Contents lists available at ScienceDirect

Technical Innovations & Patient Support in Radiation Oncology

journal homepage: www.elsevier.com/locate/tipsro



Case reports and case series

Case Report: Education and training of RTTs for radiation oncology departments in Russia



V.V. Glebovskaya *, S.I. Tkachev, A.V. Nazarenko, B.I. Dolgushin, E.V. Khmelevskiy, M.V. Kislyakova

Federal State Budgetary Institution "N.N.Blokhin National Medical Research Center of Oncology" of the Ministry of Health of the Russian Federation, Russian Federation

- RTT tanımı resmi olarak tanınmıyor
- RTT spesifik eğitim programı yok
- Hemşirelerden seçiliyor (6-18 ay eğitim)

ÜLKEMİZDE RTT

- 6 Nisan 2011 Tarih ve 6225 Sayılı Kanunla de ğişik 11 Nisan 1928 tarih ve 1219 sayılı kanunda;
- *‘RT teknikeri meslek y üksekokullarının RT programından mezun; tabibin haz ırladığı ışın tedavi program ını hastaya uygulayan sa ğlık teknikeridir.’*

ÜLKEMİZDE RTT

22 Mayıs 2014 PERŞEMBE

Resmî Gazete

Sayı : 29007

YÖNETMELİK

Sağlık Bakanlığından:

SAĞLIK MESLEK MENSUPLARI İLE SAĞLIK HİZMETLERİNDE ÇALIŞAN DİĞER MESLEK MENSUPLARININ İŞ VE GÖREV TANIMLARINA

Radyoterapi teknikeri

- a) Sorumluluğu altındaki cihazları kullanıma hazır hale getirir, arızaları en kısa sürede sorumlu kişiye bildirir.
- b) Tedavi sarf malzemelerini tedaviden önce hazır bulundurur.
- c) Radyasyon onkolojisi uzmanının belirlediği tedaviyi, sağlık fizikçisinin belirlediği ölçü ve hesaplara göre uygular.
- ç) Radyasyon onkolojisi uzmanı ve sağlık fizikçisi tarafından belirlenen fokalize blok dökümü ve diğer mould uygulamaları ile bolus, termoplastik maske ve aparatlarını uygulamaya hazır hale getirir ve uygulamada görev alır.
- d) Radyasyon onkolojisi uzmanı ve sağlık fizikçisi ile birlikte simülasyon işlemlerine katılır ve cihazları kullanır.
- e) Tedavi alanlarının simülasyon ve port filmlerinin çekimi ile ilgili iş ve işlemlerini yapar.
- f) Radyoterapi sırasında hastayı izler, beklenmeyen bir durum veya komplikasyon gelişmesi halinde ilgili tabip ve sağlık fizikçisine haber verir.
- g) İmhası gereken radyoaktif atık malzemenin bertaraf edilmesine nezaret eder ve çevreye zararlı olmasını önlemek için gereken tedbirlerin alınmasında görev alır.
- ğ) Radyasyon güvenliği ve kalite-kontrol biriminde görev alır. Radyasyon güvenliği açısından gerekli tedbirleri alır.
- h) Tehlike anında radyasyon güvenliği kurulunca hazırlanmış olan acil durum planını uygular.

ÜLKEMİZDE RTT



T.C. Sağlık Bakanlığı

T.C.

SAĞLIK BAKANLIĞI

Sağlık Hizmetleri Genel Müdürlüğü

2014

2023 YILI

SAĞLIK İŞ GÜCÜ HEDEFLERİ VE
SAĞLIK EĞİTİMİ

ANADOLU^H

In Affiliation with
JOHNS HOPKINS MEDICINE

ÜLKEMİZDE RTT



T.C.

SAĞLIK BAKANLIĞI

TEDAVİ HİZMETLERİ GENEL MÜDÜRLÜĞÜ

TÜRKİYE ONKOLOJİ HİZMETLERİ YENİDEN YAPILANMA PROGRAMI

2010-2023

Radyasyon Onkolojisi	48
Radyasyon Fizikçisi Sayısındaki Yetersizlik Ve Çözüm Önerileri	52
Radyoterapi Cihaz Donanımı	54

ÜLKEMİZDE RTT



Tablo 17. Planlama	Mevcut	2011 İhtiyaç	Açık	2023 İhtiyaç
Radyasyon Onkolojisi Uzmanı	446	420-440	-6	680
Sağlık Fizikçisi (Tıbbi Radyasyon Fizikçisi) *	150 (+50 yeni mezun)	357-450	248-300	624-780
Radyoterapi Teknisyeni	300-500	1700	1200	2800

* Her LINAC cihazına 1 adet, buna ilaveten 400 yeni hastaya bir fizik mühendisi düşecek şekilde hesaplandı

** LINAC başı 1,7 Radyoterapi fizikçisi (ACPSEM)

ÜLKEMİZDE RTT

SHYMO RADYOTERAPİ TEKNİKERLİĞİ ÖĞRENCİ KONTENJANLARI

9 Eylül Üniversitesi	15
Acıbadem Üniversitesi	20 + 5
Ankara Üniversitesi	20
Erciyes Üniversitesi	20
Hacettepe Üniversitesi	30
TOPLAM YILLIK	110

Tarık Yağıbasan 2012-
Urok

15 Mart 2014 yılında mezun tekniker sayısı 331(SB)

ÜLKEMİZDE RTT

2014 yılı verileri

-14 okul
-327 yeni kayıt
-538 öğrenci

1. Acıbadem Üniversitesi Sağlık Hizmetleri Meslek Yüksekokulu
2. Ankara Üniversitesi Sağlık Hizmetleri Meslek Yüksekokulu
3. Bezm-i Alem Vakıf Üniversitesi Sağlık Hizmetleri Meslek Yüksekokulu
4. Dokuz Eylül Üniversitesi Sağlık Hizmetleri Meslek Yüksekokulu
5. Erciyes Üniversitesi H. Bayraktar Sağlık Hizmetleri Meslek Yüksekokulu
6. Hacettepe Üniversitesi Sağlık Hizmetleri Meslek Yüksekokulu
7. İstanbul Aydın Üniversitesi Sağlık Hizmetleri Meslek Yüksekokulu
8. İstanbul Gelişim Üniversitesi İstanbul Gelişim Meslek Yüksekokulu
9. İstanbul Medipol Üniversitesi Sağlık Hizmetleri Meslek Yüksekokulu
10. İstanbul Üniversitesi Sağlık Hizmetleri Meslek Yüksekokulu
11. Nişantaşı Üniversitesi Nişantaşı Meslek Yüksekokulu
12. Okan Üniversitesi Sağlık Hizmetleri Meslek Yüksekokulu
13. Trakya Üniversitesi Sağlık Hizmetleri Meslek Yüksekokulu
14. Yüzüncü Yıl Üniversitesi Van Sağlık Hizmetleri Meslek Yüksekokulu



ÜLKEMİZDE RTT

Üniversite Adı	Meslek Yüksekokulu
ACIBADEM MEHMET ALİ AYDINLAR ÜNİVERSİTESİ (İSTANBUL)	Sağlık Hizmetleri Meslek Yüksekokulu
BAHÇEŞEHİR ÜNİVERSİTESİ (İSTANBUL)	Sağlık Hizmetleri Meslek Yüksekokulu
ANKARA ÜNİVERSİTESİ	Sağlık Hizmetleri Meslek Yüksekokulu
HACETTEPE ÜNİVERSİTESİ (ANKARA)	Sağlık Hizmetleri Meslek Yüksekokulu
İSTANBUL MEDİPOL ÜNİVERSİTESİ	Meslek Yüksekokulu
DOKUZ EYLÜL ÜNİVERSİTESİ (İZMİR)	Sağlık Hizmetleri Meslek Yüksekokulu
İSTANBUL MEDİPOL ÜNİVERSİTESİ	Meslek Yüksekokulu
İSTANBUL MEDİPOL ÜNİVERSİTESİ	Sağlık Hizmetleri Meslek Yüksekokulu
İSTANBUL ÜNİVERSİTESİ-CERRAHPAŞA	Sağlık Hizmetleri Meslek Yüksekokulu
ERCİYES ÜNİVERSİTESİ (KAYSERİ)	Halil Bayraktar Sağlık Hizmetleri Meslek Yüksekokulu
BİRÜNİ ÜNİVERSİTESİ (İSTANBUL)	Meslek Yüksekokulu
BEZM-i ÂLEM VAKIF ÜNİVERSİTESİ (İSTANBUL)	Sağlık Hizmetleri Meslek Yüksekokulu
ÜSKÜDAR ÜNİVERSİTESİ (İSTANBUL)	Sağlık Hizmetleri Meslek Yüksekokulu
İSTİNYE ÜNİVERSİTESİ (İSTANBUL)	Sağlık Hizmetleri Meslek Yüksekokulu
İSTANBUL OKAN ÜNİVERSİTESİ	Sağlık Hizmetleri Meslek Yüksekokulu
TRAKYA ÜNİVERSİTESİ (EDİRNE)	Sağlık Hizmetleri Meslek Yüksekokulu
İSTANBUL AYDIN ÜNİVERSİTESİ	Sağlık Hizmetleri Meslek Yüksekokulu
VAN YÜZÜNCÜ YIL ÜNİVERSİTESİ	Van Sağlık Hizmetleri Meslek Yüksekokulu
BEYKENT ÜNİVERSİTESİ (İSTANBUL)	Meslek Yüksekokulu
İSTANBUL RUMELİ ÜNİVERSİTESİ	Sağlık Hizmetleri Meslek Yüksekokulu
İSTANBUL ŞİŞLİ MESLEK YÜKSEKOKULU	İstanbul Şişli Meslek Yüksekokulu
İSTANBUL GELİŞİM ÜNİVERSİTESİ	Sağlık Hizmetleri Meslek Yüksekokulu
ALTINBAŞ ÜNİVERSİTESİ (İSTANBUL)	Sağlık Hizmetleri Meslek Yüksekokulu
İSTANBUL GELİŞİM ÜNİVERSİTESİ	Sağlık Hizmetleri Meslek Yüksekokulu
İSTANBUL AYDIN ÜNİVERSİTESİ	Sağlık Hizmetleri Meslek Yüksekokulu
NIŞANTAŞI ÜNİVERSİTESİ (İSTANBUL)	Nişantaşı Meslek Yüksekokulu
İSTANBUL MEDİPOL ÜNİVERSİTESİ	Sağlık Hizmetleri Meslek Yüksekokulu
BEYKENT ÜNİVERSİTESİ (İSTANBUL)	Meslek Yüksekokulu
NIŞANTAŞI ÜNİVERSİTESİ (İSTANBUL)	Nişantaşı Meslek Yüksekokulu
DOĞU AKDENİZ ÜNİVERSİTESİ (KKTC-GAZİMAĞUSA)	Sağlık Hizmetleri Yüksekokulu
BEZM-i ÂLEM VAKIF ÜNİVERSİTESİ (İSTANBUL)	Sağlık Hizmetleri Meslek Yüksekokulu
ÜSKÜDAR ÜNİVERSİTESİ (İSTANBUL)	Sağlık Hizmetleri Meslek Yüksekokulu
YAKIN DOĞU ÜNİVERSİTESİ (KKTC-LEFKOŞA)	Sağlık Hizmetleri Meslek Yüksekokulu
İSTANBUL ŞİŞLİ MESLEK YÜKSEKOKULU	İstanbul Şişli Meslek Yüksekokulu
GİRNE AMERİKAN ÜNİVERSİTESİ (KKTC-GİRNE)	Sağlık Meslek Yüksekokulu
LEFKE AVRUPA ÜNİVERSİTESİ (KKTC-LEFKE)	Sağlık Hizmetleri Meslek Yüksekokulu
İSTANBUL MEDİPOL ÜNİVERSİTESİ	Sağlık Hizmetleri Meslek Yüksekokulu
İSTANBUL MEDİPOL ÜNİVERSİTESİ	Meslek Yüksekokulu
BİRÜNİ ÜNİVERSİTESİ (İSTANBUL)	Meslek Yüksekokulu
BEYKENT ÜNİVERSİTESİ (İSTANBUL)	Meslek Yüksekokulu
ÜSKÜDAR ÜNİVERSİTESİ (İSTANBUL)	Sağlık Hizmetleri Meslek Yüksekokulu
YAKIN DOĞU ÜNİVERSİTESİ (KKTC-LEFKOŞA)	Sağlık Hizmetleri Meslek Yüksekokulu
BİRÜNİ ÜNİVERSİTESİ (İSTANBUL)	Meslek Yüksekokulu
İSTANBUL AYDIN ÜNİVERSİTESİ	Sağlık Hizmetleri Meslek Yüksekokulu
TRAKYA ÜNİVERSİTESİ (EDİRNE)	Sağlık Hizmetleri Meslek Yüksekokulu

-Yaklaşık 90 RTT okulu

-1500 kontenjan

-10-15 hastanesi olmayan okul

ANADOLU^H

In Affiliation with
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ÜLKEMİZDE NELER YAPILABİLİR

- Tekniker eğitim müfredatı iyileştirebilir
- Teoriğin yanında pratik uygulamalar arttırılabilir.
- Tekniker tan ımının ölkemizde bilinen standartlardan daha fazla anlam ı oldu ğu alg ısı arttırılmalı
- Meslek i ç i e ğitimler olmalı ve bu e ğitimler bir ciddiyet içinde yürütölmeli
- Ekonomik standartlar arttırılmalı
- İngilizce eğitimi mutlaka olmalı
- Uluslar aras ı ileti şimlere a çık olmalı ve d ünyayı takip etmeli

ÜLKEMİZDEKİ PROBLEMLER

- Sınıf mevcutları öğrenmeyi zorlaştırmakta
- Okulların uygulamalı dersleri işleyecek gerekli ekipman hatta hastaneleri yok
- Öğretim görevlileri branş öğretmen değil
- Eğitim ücretleri pahalı
- Hasta sayısı çokluğundan stajda teknikere öğrenme fırsatı yok
- İş imkanı neredeyse yok gibi

TEŞEKKÜRLER