Royal College of Radiologists Response: Brexit – medicines, medical devices and substances of human origin inquiry

1. The Royal College of Radiologists (RCR) works with our 10,000 members to improve the standards of practice in the specialties of clinical radiology and clinical oncology. We have focused this response on those issues particularly relevant to our specialties, which include the availability of medical devices, the supply of medical radioisotopes and the impact on research.

1. What are the key considerations that arise for companies, healthcare services and regulatory bodies in the UK as a result of the UK's withdrawal from the EU? Focussing on patients and the public, what needs to be done to ensure that any adverse impact is minimised or eliminated, and that opportunities to enhance services are maximised?

2. The UK's withdrawal from the European Union will have a significant impact on the oncology and radiology workforce. Six percent of clinical oncology consultants and ten percent of consultant radiologists qualified in the EU.[1] [2] In addition, approximately 16% of the academic workforce in the UK is from other parts of the EU[3]. There is a possibility of decreased clinical research engagement and influence beyond the UK, especially if relevant staffs, who are already overstretched, end up leaving the UK at an increased rate and not being properly replaced. To ensure that patients have access to the best care possible, adverse impact should be minimised by ensuing that current EU workforce are able to remain in the UK and the UK is able to continue to attract the clinical and research staff it needs.

3. The EU also covers almost all aspects of medicine licensing as well as the licensing of medical devices. When the UK leaves the EU it must decide whether to accept the current EU standards, accept a deregulation of the sector, which has implications for patient safety, or whether to introduce a whole new set of standards, which will need time to be implemented. This may also increase regulatory complexity if the UK choses to differentiate itself markedly from the EU for approvals and accreditations. A new system may discourage internationally-focussed providers from jumping through specific UK hoops for providing to the UK drugs, agents, technology that are/will be key to advanced clinical procedures. In order to minimise this international agreements and a UK structure that support the equivalence of approvals with the EU should be put in place. This will streamline any approval process and optimise its complexity, cost and relevance.

[1] Royal College of Radiologists, *Clinical oncology UK Workforce Census 2016*, London: RCR September 2017
[2] The Royal College of Radiologists, *Clinical radiology, UK workforce 2016 report*. London: RCR October 2017
[3] Fahy et al How will Brexit affect health and health services in the UK? Evaluating three possible scenarios. Lancet, 28 September 2017

2. Following the UK's withdrawal from the EU, what alternative arrangements for the regulation of medicines, medical devices, medical products and substances of human origin could be introduced? What are the respective opportunities, risks and trade-offs involved?

4. If the UK leaves the EU system of medicine licencing it will be excluded from the sole process for authorising medicines across the EU and the benefits that brings in terms of speed and cost. The UK needs to develop its own regulatory system unless it is to accept decisions of other bodies like Food and Drug Administration (FDA) or European Medicines Agency (EMA).

5. The Medical Devices Directive[4] governs how new medical devices are approved in the European Union and how the CE marking is authorised[5]. Under current arrangements manufacturers can obtain a licence from one member state which will then grant access to whole EU market.

6. There is potential for the UK to establish its own national procedures which may improve standards[6]. The UK may continue to be an attractive place for manufactures to licence their products as the UK is the third biggest medical technology market[7]. However there are significant risks with this approach as it could add complexity and cost, which means UK may end up getting access to new therapies and latest approaches well after other countries and after being deemed as a less viable market by potential providers.

7. Regulatory bodies of the UK and EU need to have reciprocal and/or fast-track approvals in order for full approvals not to have to be duplicated for markets that are geographically, demographically and culturally so close.

8. There may also be implications for hardware and software as suppliers may need to obtain new UK specific certifications even rebuild software to adhere to new regulations.

3. How much time is needed to facilitate a smooth transition to new arrangements? Is it possible, or desirable, to move directly to new arrangements post-29 March 2019, or are transitional arrangements needed?

9. As many of the new arrangements will require new legislation and/or new frameworks as much time as possible will be needed. A fixed transition period would be helpful to allow the various agencies to prepare.

4. How will withdrawal from the European Union affect the UK's ability to influence international standards in life sciences?

10. While UK life sciences are well regarded internationally, this is unlikely to continue to be the case if funding and expertise at the necessary level become unavailable. This

[4] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31993L0042
[5] http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:31993L0068
[6] Piorkowska, M & Goh,V & Booth, T. (2017). Post Brexit: Challenges and Opportunities for Radiology Beyond the European Union. The British Journal of Radiology.
[7] Piorkowska, M & Goh,V & Booth, T. (2017). Post Brexit: Challenges and Opportunities for Radiology Beyond the European Union. The British Journal of Radiology.

situation will eventually affect the quality and relevance of the research, and UK's overall standing in life sciences and many other domains or disciplines.

11. Influence will likely be guaranteed only at the UK level and through the UK system, with mitigations already taking shape at the EU level, for instance by tacit replacement of potential UK partners by suitable (post-Brexit) EU ones in any new proposal. Scientists, academics, experts and other professionals leaving the UK as a result of Brexit will only compound this.

12. Possible mitigation may come from fostering and retaining talents and ensuring as much as feasible the maintenance/expansion of existing networks, partnerships and suitable levels of funding.

5. What arrangements are needed to ensure the safe, effective and timely supply of medical radioisotopes over the short, medium and long-term?

13. Radioisotopes play a crucial role in medicine. The majority of the UK's supply of radioisotopes, used in scanning and the systemic and internal treatment of a wide range of cancers, is imported from Europe and further afield. The UK does not produce any radioisotopes made in a nuclear reactor. The clinically most important of these is molybdenum-99 (^{99m}Mo) from which technetium-99m (^{99m}Tc), the most commonly used radioisotope, is derived. ^{99m}Tc is used in 700,000 medical procedures each year.[8] Global demand for ^{99m}Mo is growing *by* 0.5% a year[9]

14. The European Atomic Energy Community (Euratom) supports the secure and safe supply and use of medical radioisotopes [10] The UK will withdraw Euratom when we leave the European Union (EU). Therefore the UK will no longer have access to Euratom's support, so ensuring a seamless continuing supply must form a key part of Brexit negotiations. The UK should remain part of Euratom during any transition period.

15. The supply of radioisotopes may also be disrupted if and when the UK leaves the single market as any transport delays will reduce the amount of useful radioisotope because they decay within hours or days of production, ^{99m}Mo has a half life of just 66 hours. The consequences of a disrupted radioisotope supply has been demonstrated when the Eurotunnel fire in 2008, led to a reduction of the availability of radioisotopes and to cancelled procedures.[11]

16. In the short and medium term, similar legislation to that currently governing transport of medical radioisotopes across borders in the EU, must be put in place. This requires detailed discussion by the Government, with key stakeholders, to plan and implement a national strategy on the use of radioisotopes across the UK, which must

[8] Future Supply of Medical Radioisotopes for the UK, British Nuclear Medicine Society and the Science and Technology Facilities Council, 2014
[9] 2017 Medical Isotope Supply review 99Mo/99mTc Market Demand and Production Capacity Production 2017-2022 OECD Nuclear Energy Agency's High level Group on the Security and Supply of medical radioisotopes 2017 https://www.oecd-nea.org/cen/docs/2017/sen-hlgmr2017-2.pdf
[10] Mission Statement Euratom supply agency
[11] http://www.world-nuclear-news.org/np_isotope_supply_further_tightened_by_transport_restrictions_0110081.html

look at supply, cost and future proofing. When new customs agreements are set up, the arrangements for the importing of radioisotopes must be the same as they are now to ensure there are no delays at the border.

17. In the long term, there will need to be sustained and significant investment in the ability of the UK to produce its own radioisotopes. Building a new research nuclear reactor would cost £200-400m and would take ten years[12], so would require investment from the Government or industry.

18. The UK should consider diversifying its strategy of reliance on reactor-based ^{99m}Mo and support the development of non-reactor based ^{99m}Mo. The most promising technology for the provision of ^{99m}Tc in the UK is its direct production by proto cyclotron bombardment. However, existing UK cyclotrons are not powerful enough for such production, and any material produced would need to be licensed before use.[13]

6. What are the implications for medical research and development, including for the timely patient access to new medicines, technologies and other relevant medical innovations developed within or outside the U.K? How can any adverse consequences be avoided or mitigated and any potential opportunities be enhanced?

19. Leaving the EU has far reaching implications for medical research. Clinical medicine has received more funding from EU government bodies than any other discipline in the UK, with universities alone receiving around £120m a year (based on 2014/15). The increase (growth rate) of funding from the Government for clinical research (12%) is slower than the growth rate of the EU's clinical research funding (17%).[14] Medical research is vital to UK economy, contributing £7.6 billon[15]. The Government has committed to underwriting existing funding under the Horizon 2020 scheme but there needs to be long term commitment to ensuring that medical research is adequately funded and the UK can keep its status as a world leader.

20. A hard Brexit may mean that the UK will be excluded from participating effectively in medical research due to an additional regulatory layer. The research costs will be higher and so the UK will not be seen as an economically attractive site. The UK may also lose our direct voice in Europe, opportunity to influence policy and to access funding. The UK healthcare market is small and strongly regulated in comparison to Europe; any increase in costs for UK research will make the UK appear less attractive for investment.

21. Medical research operates within an EU regulatory framework, for example clinical trial regulation, which means that patients across Europe can participate in trials,

[12] B Lee, Securing a Sustainable Supply of Medical Isotopes for the UK, Nuclear Innovation and Research Advisory Board Oct 2014
[13] Future Supply of Medical Radioisotopes for the UK, British Nuclear Medicine Society and the Science and Technology Facilities Council, 2014
[14] The Academy of Medical Sciences, The role of EU funding in UK research and innovation https://acmedsci.ac.uk/file-download/47156233
[15] Iredale, J, Brexit and Science, where do we go from here *QJM: An International Journal of Medicine*, Volume 109, Issue 10, 1 October 2016

allowing both researchers to be able to sufficiently recruit and for patients to have the opportunity to participate. Any divergence from the standard frameworks may mean an additional administrative burden, making the UK a less attractive partner in research.

22. The regulatory system post Brexit should ensure that the UK is an attractive place to do research and not result in delaying access to new treatments. The UK needs to maintain and expand links and networks with non-UK partners, both for research and sharing best practice.

Royal College of Radiologists
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