

Is British Dermatology better in or out of Europe?

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Introduction

'I think I may need to go back to Spain but I don't want to. There are no nursing jobs there', a concerned Spanish nurse confessed to me during the dermatology clinic. British dermatology is better in Europe, but the EU citizens handling part of the 13 million annual dermatology consultations¹ are only one side of the equation. Brexit will have widespread effects in all aspects of dermatology, ranging from basic and clinical research, through day-to-day healthcare provision, to innovations leading the field. In this essay, I will first discuss how we can approach the concept of British dermatology, to then expose the extensive impact of Brexit on research, clinical dermatology, and on the future of dermatology in the UK. Finally, I will outline what measures can be implemented on the face of an imminent departure from the EU.

Table 1. Overview of main aspects of British dermatology affected by Brexit

Dermatology research	Clinical dermatology	Innovation
Research collaboration	Healthcare funding	Electronic and mobile health interoperability
Research accountability and regulatory frameworks	Access to medicines and pharmacovigilance	Big data and research databases
Research funding: public and industry funding	Public health surveillance	Teledermatology
Researchers and academics: UK, non-UK EU and EU citizens	Clinical staff: specialists, nurses and GPs	Image recognition software

Defining British Dermatology

The early days of British Dermatology can be traced back to Daniel Turner's *De morbis cutaneis* (1714), the first book in English dedicated to skin disease². The most important contribution to the field, however, was arguably made by Robert Willan in *On cutaneous diseases* (1808), where he pioneered the first classification of dermatological conditions³. Clinical dermatology also flourished in the XIX century, with William Tilbury Fox being appointed the first full-time hospital dermatologist at Charing Cross Hospital in 1867. Rising interest in the specialty led to further seminal contributions, including that of J.M.H Macleod, who paved the way for dermatopathology in his *Practical Handbook of the Pathology of the Skin* (1903)⁴.

British Dermatology clearly had a prominent role in the specialty – but how can we reduce a specialty to its nationality? Progress does not occur within the closed borders of a nation: Willan was influenced by Swedish taxonomist Linnaeus and his classification of organisms. Similarly, MacLeod was profoundly shaped by Unna during his time in Hamburg. In fact, he openly acknowledged at the time⁴:

[The teaching of dermatology in London] for postgraduates was so decentralized and ineffective that intending specialties were forced to pursue their studies in the organized schools of dermatology on the Continent.

Long before the consolidation of political and economic unions in Europe, what drove the progress of dermatology was not an isolationist position, but a back-and-forth exchange of ideas between Britain and the Continent.

The impact of Brexit on dermatology research

If the UK leaves the EU, British research will suffer due to interrelated effects on research collaboration, accountability, funding and staff. This would constitute an additional blow to a trend of declining research capability. Bibliometric data shows that the proportion of British-authored papers in the Journal of Investigative Dermatology and the British Journal of Dermatology decreased from 10% to 6% between 1989 and 2005⁵.

Research collaboration brings benefits for both British and European dermatology. Rare dermatological diseases are the clearest example of how it would be difficult for national researchers to gain funding, amass the necessary expertise, and recruit patients to power clinical trials of rare diseases. To tackle this, the EU has developed European Reference Networks (ERNs), aiming to improve the diagnosis and management of these conditions. The ERN-Skin is constituted by 56 centres of expertise in rare and complex skin diseases from 18 countries⁶, with the UK currently involved in 40% of adult rare diseases trials⁷. Exiting the EU would mean exiting this research network, with the care of patients with these diseases consequently deteriorating.

EU membership also provides accountability and ease of implementation. The spread of good research practice is typically driven by adoption of policies from

one country into a centralised body present in several countries. The EU Clinical Trials Register, an online register giving public access to data on trials conducted in the EU, was launched in 2011⁸. Furthermore, the new EU Clinical Trials Regulation, expected to be implemented in 2018⁹ will aim to ensure harmonisation by providing a single application for trials across the EU.

Abandoning this regulatory framework could jeopardise the participation of the NHS in multi-national trials, since these fall under EU rules. The European Medicines Agency is already considering relocating from its London headquarters after Brexit. Research bodies and companies would also have the additional administrative burden of applying for separate centralised and national authorisations, creating a negative incentive for conducting research in the UK. The National Eczema Society has already been warned by two pharmaceutical companies that new trials would not take place in the UK if Brexit is implemented¹⁰.

Interestingly, the relocation of an editorial office of a journal from the UK to another country could, by itself, have an impact in publication number. A 2006 study showed a decrease in European publications in 1997-2002, when the office of the Journal of Investigative Dermatology moved from Europe to the US¹¹. Even less definable factors, such as the political turmoil that the UK is suffering, have been linked decreases in research output, as demonstrated by falling dermatology publications in Central Europe in 1991-2002¹².

Leaving the EU would also have a substantial impact in research funding. The UK is the second largest recipient of EU competitive research funding, securing €6.9 billion in 2007-2013¹³. It also leads in terms of projects won for the EU Programme Horizon 2020, which has a budget of €79 billion¹⁴. One example of a Horizon-funded project is the Psoriasis Anti-inflammatory Treatment Initiative, a collaboration between the UK, Switzerland and Spain exploring oral and topical treatment for psoriasis¹⁵. In a post-Brexit scenario, future projects will have added difficulties to access this funding or be unable to apply altogether.

Another major funding source affected would be industry funding. Although initiatives like the UK Dermatology Clinical Trials Network¹⁶ are an important step towards funding trials without the bias and conflicts of interests introduced by pharmaceutical companies, industry research will continue to form a significant proportion of trials. This trend is likely to be exacerbated by a growing pharmaceutical industry¹⁷, combined with a decline in public-funded research¹⁸. The national research budget has been frozen since 2010 and the government has displayed no signs of modifying this trend. Only 0.5% of the GDP was devoted for research in 2012¹⁹, putting the UK at the bottom of the G8.

Finally, the uncertainty over the rights of migrants has already created a worrisome climate among researchers. In a recent survey of more than 1000 UK-based university staff, 42% of all academics and 76% of non-UK EU academics had considered leaving the UK due to the referendum outcome²⁰. Altogether, this could lead to a 'reverse brain drain' where non-UK EU citizens return to their

countries of origin or migrate elsewhere, which could have a knock-on effect on both UK and non-EU citizens conducting research in Britain.

The impact of Brexit on clinical provision

But the gloomy effects of Brexit will also extend to the provision of dermatology services. It may go to the extent of compromising patient care by interrelated effects on the funding of dermatology services, availability of treatments, and staff shortages.

Two of the key messages disseminated by the Leave Campaign were that the UK was paying the EU £350 million a week, and that health tourism was a significant burden for the NHS²¹. Although the former has been retracted by the campaign, the impact of health tourists in NHS budgeting needs to be examined closer. This effect is difficult to calculate²², but data based on unpaid NHS charges estimate a figure of £11.5 million in 2011-12²³. Although by no means a small figure, this constitutes only 0.013% of the £89-billion NHS budget for the same period²⁴.

There is reason to believe that the effect on dermatology compared to other specialties is even smaller, since it is mostly a clinic-based rather than an acute specialty. Furthermore, the London School of Hygiene and Tropical Medicine found that the UK actually exports more patients than it imports²⁵, and figures from 18 different hospitals showed that even though health tourists are only 7% of their patient population, they contribute 25% of their private income²⁶.

Healthcare provision is already being cut across the whole of Britain, with services having to make 'efficiency savings' despite the NHS being rated the most

efficient healthcare system out of 11 developed countries²⁷. The economic downturn, on top of a political agenda encouraging privatisation, is bound to erode patient care. In 2015, a national centre for excellence in dermatology in Nottingham University Hospital lost their contract to the private firm Circle and was virtually closed, having to transfer all acute adult patients to Leicester²⁸.

Being outside of the common regulatory framework may also make it harder for patients to access medicines. Companies may no longer see the UK as a priority market due to the burden of having to apply for different marketing authorisations. This may delay the introduction life-changing treatments for dermatology patients. Once the drugs have been introduced, the cost of pharmacovigilance will also increase, as the UK will have to conduct its own drug compliance protocols with less shared expertise and data sources. The depreciation of the sterling may drive up the prices of products manufactured in Europe²⁹, which could tempt patients to consider cheaper substandard products, which may be irritant or allergenic and not comply by EU safety standards³⁰.

Public health measures could also be affected. The European Centre for Disease Prevention and Control disseminates surveillance data on 52 communicable diseases including viral exanthems, HIV/AIDS, meningococcal disease, and scrofula, all of which have cutaneous manifestations³¹. Opting out of this system could create barriers for data collection, analysis, and disease prevention.

Similarly, the alienation of immigrants could deter them from seeking treatment for these diseases, creating public health risks.

Analogous to the exodus of academics, staff shortages within the NHS are likely to be worsened by a departure from the EU. EU nationals make up 10% of doctors³², with many considering leaving due to a climate of uncertainty and an anti-immigrant zeitgeist. This unhelpful climate could have a domino effect on non-EU immigrants, which constitute a further 26% of doctors.

Dermatology services cannot afford losing these professionals on the face of an increasing demand driven by an ageing population and a rising skin cancer incidence. This is compounded by a shortage of more than 200 dermatology consultants across the UK¹. This trend is set to continue, as Health Education England commissioned 177 specialty-training posts in dermatology in 2014-15, a reduction from previous years. The ratio of consultant dermatologists per capita, with 1 consultant per 130 000 people, is also much lower than the European average³². This is partly explained by the different service structure, since the general population can access specialists directly in most European countries, whereas in the UK they have to go via a GP referral. Nurses, 7% of which are EU nationals³³, also provide essential dermatology services, including wound care, patch testing, photodynamic therapy, and patient education.

GPs provide the point of access to hospital services, with dermatological problems amounting to 15% of primary care consultations³⁴. Shortages of GPs may increase dermatology referral rates, which have already raised 15.5% since 2007¹. Due to a reduction in training time, budget cuts are also likely to affect GPs with a Special Interest (GPwSI), a role with the potential to offload the dermatology workload³⁵. Indeed, a randomised controlled trial assigned 556

patients with non-urgent skin problems to care under a GPwSI versus usual outpatient hospital care, showing no differences in median dermatology life quality index score³⁶. Finally, the EU has a track record of protecting workers' rights, including equal pay, maternity rights, and safeguards against needlestick injuries^{37, 38}.

Looking ahead: what does Brexit mean for the future of dermatology?

Although not as immediate, we should not neglect the effects of Brexit in long-term innovation. The EU has pioneered interoperability in electronic and mobile health^{39, 40}, providing doctors with patient data to improve the treatment of citizens while abroad, including British citizens.

Big data can be mined to answer research questions in dermatology. A study using the General Practice Research Database analysed the data of 130 976 psoriasis patients in 1987-2002, finding an increased risk of myocardial infarction after adjusting for traditional cardiovascular factors⁴¹. As the name suggests, big data is better the larger the database, something achievable by combining British and pan-European databases to optimise patient surveillance.

Due to its visual nature, dermatology has immense potential for health technology. In 2011, the Royal Devon and Exeter NHS trust piloted a teledermatology service, resulting in 60% of referrals being managed by GPs following teledermatology referral¹. This technology could support primary care and provide specialist access in remote and rural areas. Another exciting field is image recognition software for malignant skin lesions⁴². However, departing the

European Digital Single Market could delay technology development due to proprietary and procurement issues.

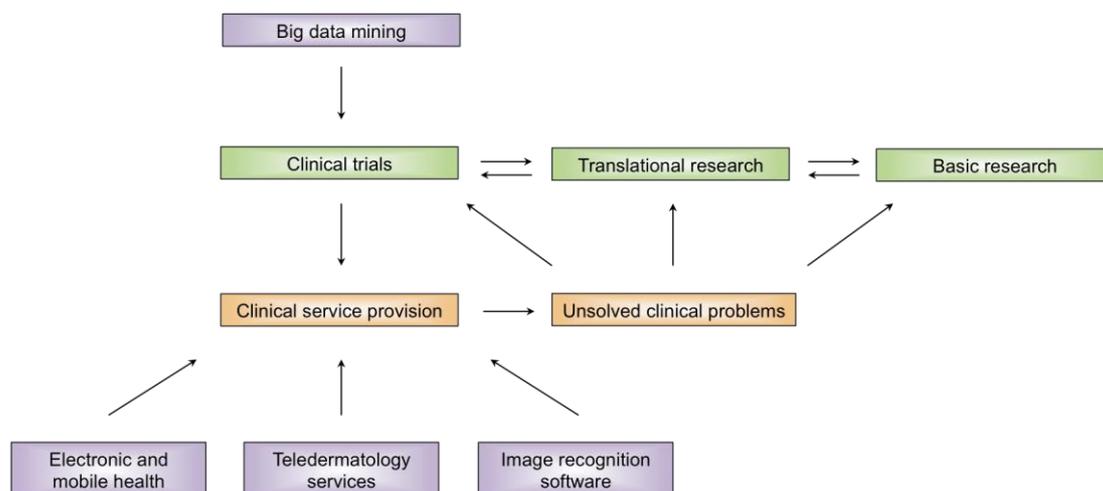


Figure 1. How health technology within the European Single Digital Market can contribute to innovation in research and clinical dermatology.

Cushioning the blow: what can we do?

So what steps can be taken to minimise the impact of Brexit in the different aspects of British dermatology? Optimising integration with the EU in economic, legal and regulatory aspects will be key to ensure research funding and collaboration with Europe. The ideal situation would be membership of the European Economic Area, following the Norwegian model. Similarly, mutually recognising or integrating European regulations into British frameworks would incentivise the regulation and procurement of drugs and medical devices, promoting innovation.

In terms of research and policy, it will be important to reinforce British influence on non-EU based networks, including the European Society for Dermatological

Research and the European Dermatology Forum. Similarly, British dermatology should not limit itself to Europe, and strengthen existing links while creating new global ones.

Although an impact in healthcare is unavoidable, we can set regulatory measures to prevent the detrimental aspects of increasing privatisation, as illustrated by the Nottingham example. Staff shortages are best tackled proactively, by ensuring the right of EU nationals to stay and boosting morale an all-inclusive working environment. Improving the quality of referrals with defined guidelines, educational interventions, and the development of new technologies such as tele dermatology, would also help to handle the increasing demand.

Conclusion

Assuming British dermatology can be considered a distinct entity, it is likely to suffer a heavy blow from leaving Europe in the context of an increasingly globalised world. The extensive funding, shared expertise, and valuable staff provided by the EU has substantial benefits starting at wet lab research and running all the way up to population health monitoring. Harmonisation of a single European regulatory framework incentivises research and clinical cooperation, pharmacovigilance, and innovation in dermatological treatments and devices. These resources have a much needed potential to improve the provision of dermatology services on the face on an uncertain economy, an increasing load on specialists, and funding and staff cuts. While Brexit is driven by a political agenda largely out of control for everyday researchers and clinicians, we can strive for initiatives that could perhaps define a new era in

'British dermatology', characterised by innovations in population data and health technology initiatives.

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