Visions of the Everyday Cyborg: Sociotechnical Imaginaries, Law and the Future of Medical Devices Regulation

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September 2022

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Overview & Background

- What visions of the future can be found in the ecosystem of the Everyday Cyborg?
- What issues do these visions raise for the law?

Everyday Cyborgs are ‘persons with replacements and augmentations ranging from the simple to the extraordinarily complex, for example, artificial joint replacements, implanted devices such as pacemakers and the total artificial heart, and limb prostheses.’ (Quigley & Semande, 2018)

Hybrid between machine and biological organism living in modern society (Haddow, 2015)

Creatures of social reality as well as science fiction (Haraway, 1991)

Empirical work to date

40+ interviews with EDCs – narrative and semi-structured components
~ 6 interviews with stakeholders

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Cardiac Devices (Implanted)	Hearing Loss Devices (Attached & Implanted)	Diabetes Devices (Attached – subcutaneous)	Lower Limb Prostheses (Attached)
Pacemakers Implanted Cardioverter Defibrillator Types of person: Cardiomyopathy Heart failure Irregular heart rhythms	Over-ear hearing aids Bone Anchored Hearing Aids (BAHA) Cochlear Implants (single & bilateral) Middle ear prostheses Types of person: Degenerative hearing loss Profound deafness from birth Meniere's Disease	(Flash) Continuous Glucose Monitors (CGM) Insulin Pump 'Do-it-yourself' Artificial Pancreas System Types of person: T1D from young child T1D in adulthood	Custom made lower limb prosthetics: Over knee Below knee Types of person: Vehicle collision survivors

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Sociotechnical Imaginaries

"Collectively held, institutionally stabilised, and publicly performed visions of desirable futures animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology" (Jasanoff, 2015).

Elite: how society's structures, laws, and institutions have been constructed is what provides the power and endurance of dominant sociotechnical imaginaries (Smallman, 2020).

Grassroots: sociotechnical imaginaries as related to the act of attaching vision to concrete strategies, plans and roadmaps, alliance-making, and projects of experimentation and implementation that develop the imaginary further and improve its credibility (Tarkkala et al 2019).

Vanguards: small collectives that formulate and act intentionally to realise particular sociotechnical visions of the future that have yet to be accepted by wider collectives (Hilgartner, 2015)

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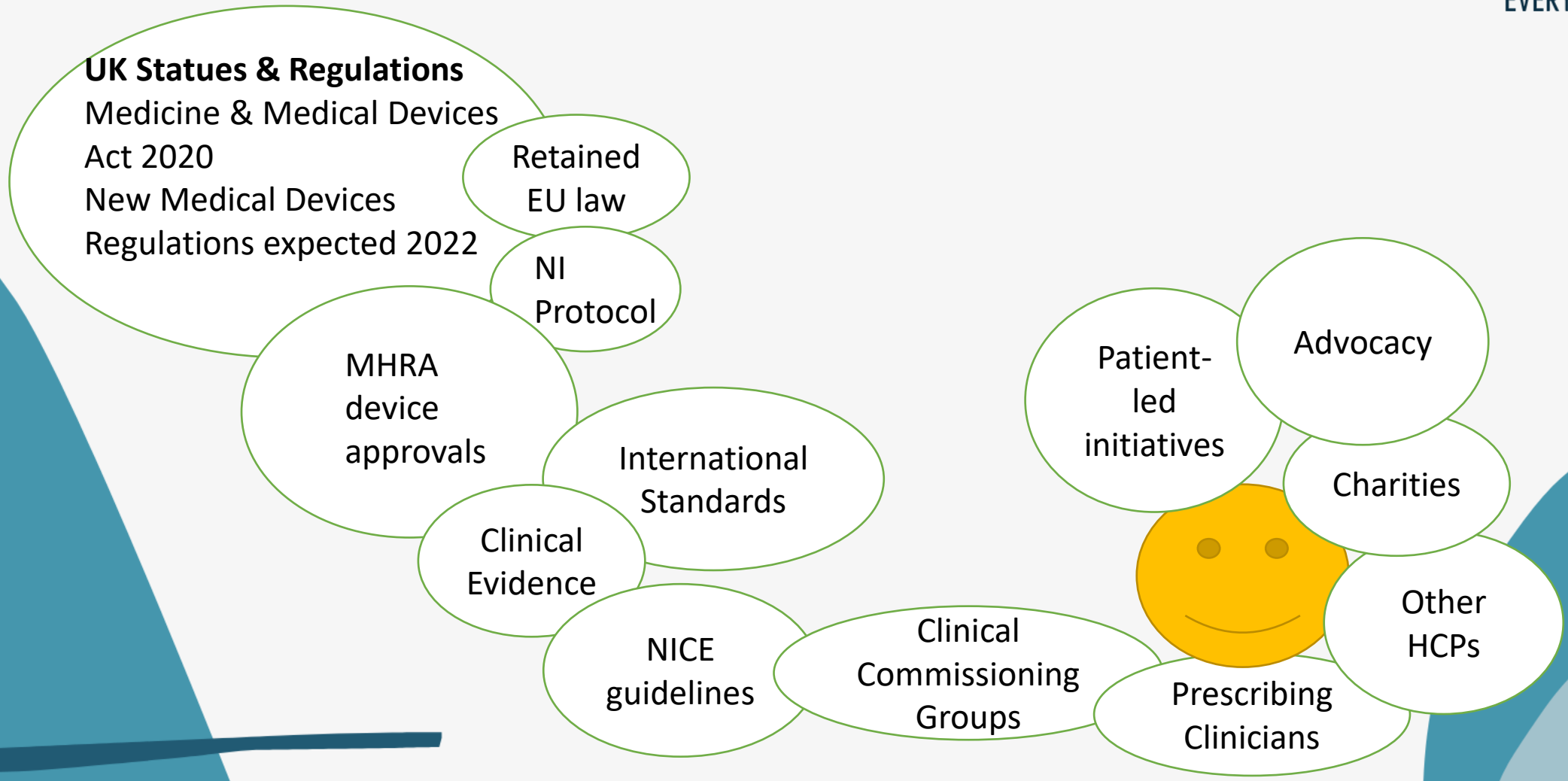
The legal ecosystem of the Everyday Cyborg



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Elite Imaginaries of the Everyday Cyborg

‘Science to the rescue’ (Smallman, 2020)

‘Belief/trust in the system’

‘Disembodied technologies’ – focus on ‘societal’ gains

Responsibility, management, appropriateness

‘Getting the tech right’

‘Investments must bear fruit’

Vision limited by institutional reality?

Grassroots Visions

Optimism!

I do think a cure for diabetes is within our grasp. As I've been diabetic for 23 years I remember, everybody says this, I remember them saying it would be cured within five years when I was diagnosed. But I'm still optimistic, I do think it's possible but it's just is it going to happen within my lifetime? I'm not sure. I think it's scientifically possible." 021221a

"I think I am an early adopter in that respect, I would, I'd rather have the benefits and manage th risks" 130122

"If they can improve on them then I'm all for that, because the strides in progress have been absolutely amazing. Obviously they can make them better because technology is improving all the time. I'm very happy with mine, but anything better would be even better."

100322

"I think that we can only get better as a species if we collaborate, so we should."

180122

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Pursuing the miniscule or, even better, the unseen!

In the future the aim is to have totally implantable devices, so everything on the inside (of the ear)". 070122

"And who knows, another couple of years, four years' down the line when this is changed will technology have changed, will it be smaller?" 200122

"the next step will be algorithms. Mechanically there is talk of non-invasive CGM and there is talk of smart insulin. The market will be there for that, alongside the autoimmune treatments that are coming along to prevent diabetes from manifesting in the first place. Those will all happen, but I think for people like me, my age group, it will be about spreading pumps."

100122

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Less interaction with the tech

I think it’s going to be more of the pump technology but possibly with fast reacting insulins and almost a dual pump with glucogon as well. So rather than you having to correct a hypo, it will automatically sort itself out. So it almost does become a full artificial pancreas and you can switch off from it.” 120122

Patient-led design & greater role for patients

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“If I could envision an ideal future that would be the one that I envision because, well, without the patient there is nothing.”

131221

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DIY APS as a sociotechnical vanguard

Challenging the status quo of medical device development

Operating outside established institutions and challenging extant power dynamics

Demonstrating an alternative way of doing things

Requiring the conversion of others to their point of view

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So what for law?

Everyday Cyborgs are a new knowledge community whose relevance for law is only going to increase – wider ramifications for social security and state provision, equality, clinical interactions

Community in their own right?

How ought law respond?

Thanks for your attention. Questions welcome!

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Work on this presentation was generously supported by a Wellcome Trust Investigator Award in Humanities and Social Sciences 2019-2024 (Grant No: 212507/Z/18/Z).