

Twenty-eight injections, two visits, one meeting: cultivating new skills for injecting medicine for rheumatoid arthritis.

Abstract

In this paper I examine the cultivation of a new skill through an autoethnographic account of learning to inject subcutaneously adalimumab for rheumatoid arthritis. Self-administered injections are increasingly prominent as part of treatment environments for a range of different conditions. The acquisition of skill is bound up with the cultivation of affects and sense-making that is dispersed across bodies, spaces, and objects. The performativity of instructions and objects are crucial for maintenance and processes of medicine. The body too is a crucial site for how learning is development and refined through a corporal engagement with the world. In this paper I explore how a new skill is learnt, developed, and coalesced. Building on recent work in social and cultural geography I argue that acquiring the skill of injecting medicine is developed through an entanglement of bodies, objects, senses, and times to create spaces of skilful learning. The implication for learning is that by taking it as a full bodily activity we can develop sensitive approaches about how we perceive, transmit, and create information. The careful consideration of how new skills are developed is essential to ensure new skills for the self-management of diseases.

Key Words: skill, learning, performativity, autoethnography, medicine

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Opening Vignette

Twelfth injection: I go through my increasingly usual procedures: laying out the cotton pad, unwrapping the plaster and wiping the skin with an alcohol wipe to prepare the injection site, I remove the cap from the injection pen. Check the window where the medicine is visible and the date with barcode. Breathe. Yellow sharps bin open. Breathe. The pen is smooth in contact with my palm. I place my left hand on my right thigh flat, with little pressure. Breathe. I decide on the spot and pause. Breathe. Hold the pen to the skin and apply pressure. Wait for the two clicks.... the first click is fine but then the pen jumps up, was it before the second click or after? Just when I was expecting this to be automatic, up pops the injection pen, I don't know if it has worked, and it feels like I'm back to where I started.

Introduction

In this paper I examine the cultivation of a new skill through my learning to inject subcutaneously adalimumab for rheumatoid arthritis. About 1% of the population in the UK has rheumatoid arthritis – more than 400,000 people (NRAS, 2022). Treatment and care can be in many forms from aids to mobility, emotional support, financial assistance, and the incorporation of different affordances into daily activities (Dokumaci, 2023). The types of medicine that is available include methotrexate, in the form of a weekly dose of tablets, which is usually the first medicine given for rheumatoid arthritis, often with another disease-modifying anti-rheumatic drug (DMARD) and a short course of steroids (corticosteroids) to relieve any pain (NHS, 2022). A biologic medicine, like adalimumab, can be prescribed if other medicine has not controlled the disease. Biologic drugs for the treatment of rheumatoid arthritis are created in laboratories from proteins and work to stop inflammation by targeting a specific tumor necrosis factor (a specific protein TUF1) (Smolen et al., 2022).

An interest in understanding the moments and processes of acquiring skills has grown across the social sciences. In this journal, Holdsworth (2022a) recently outlined the interrupted temporalities of sewing to emphasise how time is embroiled in acquiring skills while Smith (2021) has assessed how atmospheres of care are constructed and maintained during wood workshops in periods of discussion or through tool maintenance to stimulate spaces of recovery. Other work from social and cultural geography has examined how people develop a range of skills to orientate themselves to times and spaces in cities to be physically active (Barnfield, 2020), how artists' development of self-expression is based upon material, social and political knowledges in ceramicists' making (Miller, 2017), and how living simply requires the development of a 'skillscape' through practice and training with objects in a specific environment (Hunt, 2018).

Such work emphasises the concept of 'enskilment' to stress the collaborative and situated nature of skill (Ingold, 2011). Skill is described as ecological because "it is not of the individual body, but of the entire field of relations that make practice possible" (Patchett & Mann, 2018, p.26). This is not skill as the monotonous and empty repetitive activity described in terms of sport performance and 'expert-induced amnesia' in which highly skilled performers enter a state where they do not remember their actions or need to think about what they are doing (Toner & Moran, 2021). Rather, the learning, honing, and refining is generative of sensemaking that is distributed across spaces, objects, and moments. It is for this reason that skill acquisition is inherently geographical. This viewpoint is sympathetic to recent geographic

engagement with habit as propulsive and generative, arguing against the idea of habit as being fixed and unthinking (Doody et al., 2022; Schwanen et al., 2012; Yalachkov et al., 2014).

In this paper, I add to the literature on skill and skilled practices by following Holdsworth (2022a) through focusing on the doing of a practice by learning to inject medicine. The account presented here proceeds from an autoethnographic account of learning to self-administer bi-weekly injections for rheumatoid arthritis. This paper adds to the social and cultural geographic concept of learning in three ways; first, akin to Holdsworth, it recognises the importance of time, stoppages, and re-assembly of routines. But, and second, it adds to this by exploring the stop-start nature of skill development and works through this movement between aspects of becoming skilled. This connects the themes of the paper to work in cultural geography that explores the adherence to new skills for care or climate sensitive ways of living that cohere across space and time (Carr & Gibson, 2016; Springer, 2020). Prominence is given to the role of the body and how it is entangled in the learning process. Third, this account of learning considers the shifts in the assemblages of human-object-sensations, and how this entanglement informs the development of new skills. The aim is to add to the evolving discussion about the prominence of chronic disease in daily experiences and to think through modalities of care.

In this paper, I have chosen to integrate the literature review within the auto-ethnographic account of injecting medicine. This is to enable readers to work through the auto-ethnographic matter in conversation with the underpinning theoretical material. The paper is set out as follows: first, I set out the methods which includes the rationale for auto-ethnography. Then, I consider how one lives with a chronic disease and the act of being skilled at using medicine, before turning to consider the performance of instructions and the ecology of skilled practice which is bound up with the worlding of a chronic disease. Finally, I conclude by thinking through what social and cultural geography brings to our understanding of learning, and what other disciplines can learn from exploring how people live with chronic diseases.

Methods

The case study that informs this paper is drawn from my own experiences of rheumatoid arthritis (Barnfield, 2022). It involves my learning to inject subcutaneously adalimumab to manage the disease. I was diagnosed with RA in 2018 and have kept a diary of my experiences. My research diary includes different forms of 'entries' that include writing, drawing, and photography. In this paper I include some of the drawings because I feel that the act of drawing speaks to the immediacy that autoethnography attempts to capture (Brice, 2018). The period that this paper focuses on is March 2022 to May 2023 and focuses on being prescribed adalimumab which includes tests, instructions, home visits, and the initial twenty-eight injections. Names and references to specific medical settings or specialised service providers have been removed.

An autoethnographic approach is the most appropriate method for the purposes of my study because it enables the capture of a felt, lived immediacy with the reflective and analytical rigour to translate personal experience into knowledge. Autoethnography is a method that brings together participant observation or ethnographic writing with autobiography (Adams et al., 2015). The literature on how to do autoethnography is broad and covers the breadth

of the social sciences (Butz & Besio, 2009; Forber-Pratt, 2015; Tamas, 2018). It has roots in sociology and the work of Carolyn Ellis (1995, 2004; Ellis & Bochner, 2000). The intention of autoethnography is more than an academic version of autofiction. It is an approach to conducting research that seeks to draw on, analyse, and interpret lived experience.

Geographers have found autoethnographic approaches fruitful for engagement with embodied and affective experience as well as formulations of spatiality as part of wider disciplinary challenges to prioritising cognition, meaning, and textuality (Vannini, 2015). Recent work in geography has adopted autoethnographic methodology and sought to push it further by exploring the enacting of practices by focussing on the moments of making (Collins, 2020). Holdsworth (2022b) opens up autoethnography not just as a method of writing, but a method of inquiry that can encompass making which includes the assemblage of materials, process, and skills. The challenge of autoethnography therefore is how to capture elements of the research site that are practical and temporal.

As with all autoethnography, this paper is anchored in my own positionality which shapes the project. I have certain skills and capacities which inform my ability to subsume new techniques, practices, and ways of doing things into my daily routines. This is because I am fortunate to be literate, can see and hear, and I am mostly able to perform tasks that involve the manipulation of smaller objects, hold things in certain ways, and understand instruction and follow advice. This positionality, which I return to briefly below, informs how I interact with objects, professionals, and planning my own routine to start injecting. This is helped because devices and instructions are designed for my gender, my way of interpreting knowledge. Finally, my training as a social scientist informs my ability to reflect on, and draw from, my experiences.

Living with a chronic disease/becoming skilled at injections

Rheumatoid arthritis (RA) affects the body in multiple ways. This includes limiting the ability to complete daily tasks once considered straightforward, painful, and stiff joints that can flare up without warning or become a permanent part of daily life, and fatigue that can leave a person worn out and worn down (Stone & Baker, 2014; Donnelly et al., 2020). As a chronic disease there is no cure and sufferers must live with the affliction. In reality people learn to live with such conditions (Reynolds, 2022). As Arseli Dokumaci (2017) has written, to inhabit the world as a rheumatoid arthritis sufferer is to develop a series of skills and tactics to navigate daily activities, often that were once taken for granted. In focussing on the materiality of the body and its environment Dokumaci (2013) introduces the notion of affordance to describe how people living with RA adapt their practices to accommodate for their condition.

In proposing a critical disability theory of affordances, Dokumaci (2023) in a recent work, further develops how objects and people are drawn into daily tactics of living. For example, by adapting devices to button shirts or storing items in specific places that enable sufferers to retain some of their independence. This involves what Dokumaci has defined as 'micro-activist affordances' in which disability worlds are made up in the moment and without recourse to instruction or guidance. While sufferers must become skilled at living with their condition, medicine does have the potential to mitigate some effects. There are obviously spatial, gendered, raced, and aged implications to the prescribing of medicine, availability of

services, and up take (Collins et al, 2020). To suffer is not a universal condition: where, when, and how you are diagnosed and treated has important implications for each person (Prodinger et al., 2014). However, becoming skilled with RA extends to more than living with the condition and includes the management of medication and attending to relations of bodies, objects, and spaces that are part of a treatment environment (Hall & Wilton, 2017). What follows is my experiences of learning to inject medicine as part of developing my treatment environment.

(Injection) Pen

The first time I ever held an injection pen was with a nurse at the hospital during a meeting where the biological medicine assessment is carried out. I had one practice with an empty pen, which if had been real would have resulted in the needle not making contact with the skin and medicine spraying into the air. It is worth pausing here to think through the nurse's room encounter (the rest of the paper considers learning away from institutional settings). This is a space-time that is imbued with a sense of student-teacher. It is a sombre, windowless room that has all the hallmarks of institutional importance: examination bed; medicine cabinet, sink, files and folders, and a simple desk with two chairs. I do not inject in this room. Rather, I get a sense of what is coming, I appreciate the gravity of the coming situations where I will have to inject subcutaneously. For the first time I have the embodied knowledge of what the injection pen is, what its weight is, the shape of the sides, and the action required. I can ask questions and receive guidance.

{PICTURE 1 location: Drawing of the injection pen}

When I start to inject at home there are many things to remember and talk myself through from the meeting at the hospital. The push of the pen onto the skin, the holding down to release the medicine. The waiting for the second click to know that the medicine/needle have been dispensed properly and have retracted. Where to put the pen, how to hold the pen, when to use the pen. The relationship is new each time, that is because after every injection the used one is thrown into a sharps bin. Next time the same but different pen is taken from the fridge ready for use. Check the side of the pen, check its little window, remove the cap.

The weight and feel of the pen are comfortable, it is not too big or too small, nor is it too heavy or light. As a middle-aged man this probably shouldn't be a surprise as Caroline Perez (2019) has written about the way the world is made predominately for one type of body, but it is how it feels to me. However, it does need to be considered for others using this type of medicine or this type of device. The first injection pen called was designed in 1985 by a Scandinavian company. In general, pens offer more simple, accurate, and convenient delivery over syringes (Kesavadev et al., 2020). An injection pen has three components: a cartridge that holds the medicine, a disposable short needle, and an incremental "one-click per unit" dosing. The device can be either reusable or disposable. The disposable pen I use has a prefilled cartridge and is discarded after the use. The pens have been constantly updated and refined with advances in safety features such as audible clicks with each dose as well as ergonomic features to reduce the physical effort of the injection and confer more user-friendliness, accuracy, and flexibility.

The pen is part of a series of steps that are taken each time. Steps that are learnt, re-learnt, and supposedly mastered over time. As part of the biological medicine programme, two home nurse visits are organised. During these two visits the presentation of the injection pen and

the observation of an injection follows the expected pattern of skill acquisition. The nurse provides some brief information and asks some basic questions about the condition. They indicate how to hold the pen and then complete a post-injection questionnaire on a table. I sit down on the opposite side of the table throughout while the nurse goes through the information from the patient kit. I fumble with the injection pen and lay out the different tools I need: cotton wool, plaster, alcohol wipe. I have to think about sitting down, how do my legs and arms normally go, where do I put my hands? The placement of the injection pen on the leg is guided by using one hand to mark out a hands-width from the knee and angle the pen towards the outside of the leg. The placement part of the injection goes well, however, the angle of the pen and how much pressure required is not easy to grasp. The second injection feels unsteady and I am pressing far too hard to begin and lifting the pen too soon.

The two nurse visits are illuminating as one nurse advises against using a plaster for the site after injection, while the other is not concerned by this. The re-iteration of the steps and guidance from the nurse follow a traditional pattern of skill learning, 'after a few goes you'll get the hang of it' and 'it's straightforward and nothing to worry about'. The literature on skill and how skills are acquired from a cultural geography perspective complicate the notion that it is a straightforward process of learning (Andrews et al., 2021; Brown, 2022; Lucas, 2022). The shifting arrangement of assemblages change over time and space, while some elements of the injection go smoothly others do not. They seem to change each time, going forwards and backwards in terms of refinement and acquisition.

The performance of Instructions

There are many different ways to learn skills. Instruction or guidance occurs in diverse forms (Prins and Wattchow, 2020). There can be instructor led classes, home tuition, use of videos online, or guidance documents (Eimer et al, 2020). In different settings, like craft or language, it is often a mixture of these and other forms. The way the self-administered injections work employs such a mixture: booklets, videos, and the meetings with nurses. How best to understand what they are doing and how they engender a new skill? The idea of performance is useful in this regard as it is through the relationship between the different elements and environments that a new set of skills emerges. The idea of performativity of documents has developed in science and technology studies through the work of Michel Callon (2010) to think through how the networks of expert knowledge, technical devices, and regulations are implicated in the shaping of practice, space, and decision making (Brill, 2022; Robin, 2022). Such modes of knowledge impartation are performative because they instigate and are implicated in creating worlds (Amin & Thrift, 2017).

The foregrounding of space is important, because such thinking is as an ongoing contingent and contextual process, emergent through a range of practices and processes. It emphasises that sense-making is dispersed across bodies, spaces, and objects (Barnfield, 2018). Non-representational approaches have employed the concept of performativity through different types of practices. For example, McLaughlin (2023) identified how representations, both digital and material, contribute to the co-production of the Appalachian trail social life for hikers. The interplay of instructions in different forms, and how they are enacted and practiced indicates how skills are co-produced through the performance of body, text, and tool. This supports the idea that representation is not the sole epistemological medium through which knowledge is extracted from the world (McCormack, 2018).

Patient Kit

The patient kit has the instructions and details of the medicine. It also available in a short, animated video. The kit is set out with colour graphics and plain text as an attempt to guide a new user through administering an injection. The kit includes a quick reference guide with pictures of the injection procedures, an injection diary to track the injection sites and relevant notes, and a patient information guide for the storage, handling, and side effects of the medicine. The booklet, a glossy green and white guide that is presented in A5 landscape, uses a mixture of photos, graphics, and text sizes.

{PHOTO 1 location: Patient kit how to use page}

At the start of each injection, I lay the booklet out with handwritten notes from the visit by the nurse. My scrawl is in bullet points to keep the steps simple, and the patient kit enables a focus on the steps, rather than, thinking on the injection as a complete action. The effect is to create a space of repeatable blocks that can be built up in ease and possible efficiency. It has a calming effect that dampens any rising sense of dread or concern until the moment arrives when to press down and start the progression of the needle.

The idea of the booklet aims to cultivate a set of practices and sediment these practices into a refined skill. It involves the drawing together of the different aspects into a new routine that is more than the sum of its parts. It is, as Deleuze explains (1987, 69), “a multiplicity which is made up of many heterogeneous terms... never filiations which are important but alliances, alloys”. Taking the idea of performance, the patient kit and guides are suggestive of how of new skills can be understood, with sense-making dispersed across the different elements: booklet, graphic, body. In turn, they implicate and are implicated in the creation of a new world, a worlding as Kathleen Stewart (2014) has written, of disease management and self-care. A socio-technical understanding posits that operating instructions are part of the device and participate in making it work (Adriaensen et al., 2019). Thus, learning through instruction and guidance are as important as the physical handling of tools. Latour (2005) explains that milieus cannot be reduced to a pure world of words and interlocutors. Rather, they are better apprehended as textual and material assemblages that cohere with different temporalities to bring forth worlds. They play a role in the shifting modalities of learning, the back and forth, and the interpretation of graphics and guides in the physical, practical action.

{PHOTO 2 location: Injection equipment}

The ecology of skilled practice

Anthropology, particularly Ingold’s engagement with making, living, and the environment (Ingold, 2018, 2021), has influenced thinking about skill and learning in geography. In contrast to how skill is considered in disciplines such as cognitive science and psychology where it is thought of as automatic and unthinking (Toner et al., 2021), Ingold and cultural geographers have sought to emphasise that skill is a lot more complex than the poor relation of knowledge (Bell et al., 2019). It involves the combination and interplay of body-mind-environment-object. This leads to the appreciation of skill acquisition as more than copying and reproducing - any successful application is more than simple automaticity (Ingold, 2018; see also Deleuze, 1994).

There are three aspects to skill in this body of work: practical, processual, and ecological. As Payne (2018) demonstrates with reference to music composition workshops, skilled practices are refined and creative forms of thinking-acting-responding between people, objects, histories, and processes unfurl. In terms of living with rheumatoid arthritis, Dokumaci (2023) explains that this is a life that requires patterns to be learnt and improvised by bringing together novel arrangements of objects to make the world habitable, in a different way. This ingenuity speaks to the development of a skilled practice of finding new uses for things to reduce pain or accomplish previously simple tasks. It is about drawing networks or affordances that encompass object, materials, and bodies.

A person who becomes skilled acts emergently and responsively. They may have a set of instructions, but they work collaboratively with materials, plans, and precedent. In learning yoga massage, Lea (2009) showcases how being skilled is not about re-producing instructions or what is in a manual. Rather, it is about developing the ability to follow and interpret through material engagement. Foregrounded through this process is the requirement to be able to participate in the continual unfolding, continual adaption of situations. This can be seen in Holdsworth's (2022a, p.11) research in upcycling bedding into bags where bags emerge from a process of "repetitive folding and refolding of fabric, setting the sewing machine up and changing various settings, working out how to feed the bulky bags through the machine, undoing mistakes, double checking measurements before cutting and piecing before sewing". Thus, skilled practices involve adaption, mutation, and development over time and through space. Becoming skilled involves making paths and not following predicted routes (Ingold, 2021).

Chair

When one starts to do something new the focus is on the task in hand, quite literally, but after a few goes there is a growing realisation that small elements are important. The chair for me has important properties that need to be considered. It is to do with height for the leg to be in a good position to do the injection, the seat needs to be firm and flat, you don't want to sink down. There needs to be room for arms to hand and back to rest. After a few missteps I settle back on a blue chair that is used when at the dining table. After I found the chair that works best and it takes several injections, it is the beginning of developing a routine. The spatial orientation of the body and chair, limbs relaxed and at a comfortable angle. The chair pushed away from the table at a 45-degree angle to enable ease of movement for the various paraphernalia to be laid out and in reach, the arms can move easily between the objects and legs.

A note on the mundane elements that make this picture. I present the images in an isolated snapshot; this is because I inject at a moment when no one is around. I do so at the same time every two weeks when I can simply follow the stages of the process. I choose to sit in natural light, rather than artificial as this seems less clinical. I choose silence rather than music as this seems less sterile as I can hear everyday noises, washing machine or a bird singing. These are underpinned by a series of fortunate elements that allows my injection to be conducted in the quiet of my own home that is free from interruptions¹. I prefer the solitude that I have created as this, for me, encourages a calmer, more calculated approach to each injection.

¹ I thank the reviewer for instigating this line of thought.

{PICTURE 2 location: Drawing of the chair used for injection}

Writing about the creation of the shooting gallery for illegal drug injection Nicole Vitellone (2017, p.92) identifies the syringe as playing the role of producer in making the space. Here, it is the syringe that works to produce the space of the shooting gallery as a space of sensation. Drawing on Gilles Deleuze and Elizabeth Grosz (2008), Vitellone highlights how the syringe opens up a possibility to understand not an illicit or dangerous space but an aesthetically beautiful and affecting one. It encourages an extension to the empirical to consider the sense of space. What about the space of injecting that I have made which the chair seems an important constituent? This injection space, my injection space, is produced from the interplay of the trajectories of body, objects, and sensations. It too is aesthetically pleasing but whereas the syringe in the shooting gallery creates a space of intimacy, even an artistic resonance, in my injection space the chair is part of the production of a more prosaic space, with a bareness, an order that is both temporal and staged. The injection pen, the cotton wool, the alcohol wipe, the plaster, and my body co-produce this space where trajectories merge, overlap, and separate.

In this space my body enters relations with the objects that are the basis of learning to follow instructions, learning to manipulate the objects to produce a result in the body – a body without pain, with free movement, and learning how to use and move my body to create the moment of the injection (Deleuze, 1994). This is what Cutler and Mackenzie (2011, p.71) have identified as learning as a very bodily activity for Deleuze, where “there must be a creative experimentation between bodies in the world, where bodies are understood as systems of differential relations, as objective ideas” and “learning becomes active to the extent that it becomes an expression of what our bodies are capable of doing”.

Attuning to new skills

The act of learning involves synchronising and even cooperating with subtle practices that contain adjusting, correlating, and modulating with the unevenness of doing (Lorimer & Lund, 2003). In this way the acquisition of skills involves attuning oneself to new practices, materials, and sensations. Acquisition of skills in this way relates to what Kathleen Stewart (2011, p.446) has written about attunement as a form of sense-making. Whereby, attunement is the process of worlding, the inhabiting of space, where “things matter not because of how they are represented but because they have qualities, rhythms, forces, relations, and movements”. The notion of attunement has been taken up in this journal by Smith (2021) who explored how an attunement to atmospheres aids the establishment of an ethics of care and wellbeing in a recovery-oriented workshop. This foregrounds how spaces of recovery and welfare are constructed and maintained through interactions, often subtle, between bodies and practices.

Attunement isn't a teleological process to develop skilled practice. Rather, the acquisition of skills involves all sorts of mistakes, missteps, and frustrations which underlines their non-linear development (Adams, 2018; Lea, 2019). Attunement speaks to an openness to corporeal sensibilities. Karen O'Conner (2017) has written about attuning to the different aspects of making glass which comprises the material properties of glass and required tools, glass is blown into shapes, cohering in the interplay of heat, movement, dexterity,

coordination, and viscosity. This implies an openness to assembling and moving through space and time. This involves corporeal adjustment, spatial manipulation, and temporal connections. As the opening vignette highlighted this includes, but is not limited to, placing limbs in the correct place, opening the injection pen, locating the injection site in the skin, and using wipes and plasters. It is akin to learning physical practices like jogging or running. To commence running for fitness involves developing new capacities for action as well as cultivating corporeal movements and material relationships to ensure that new healthy habits can cohere (Latham, 2015). In starting to inject medicine it is the slippages and the shifting arrangements that become evident, especially if mistakes are made. Hope and colleagues (2020) have described how the shifting of assemblages opens new spaces for action in risk management. However, such new lines of possibilities require an openness to attune to the subtleties of any shifts and slippages.

Pressure and Clicks

The location of each injection changes every two weeks/time of injection. The two areas are thighs, left or right, and stomach, again alternating left or right. The idea, from the guidance document and nurse instructions, is to reduce the incidence of soreness through repeated use of a single injection site. I prefer to use the thighs, as I'm a bit squeamish about injecting into the stomach. To locate the site where I will inject, I start by ensuring I am focussing on an area a palms width away from the knee – by placing a hand to mark the space where to focus - and towards the outside of the thigh. Pressure is required to start the injection pen. Don't pinch the skin. Place the flat tip of the pen on the skin. Then apply pressure until the pen clicks. Hold and wait with the pressure maintained until the second click. This is the needle withdrawing and retracting back inside the pen. The two clicks are important to register. The audible recognition that the injection has been carried out. There is a short burst of pain that lingers for a few minutes, cotton wool after the pen has been removed to stop any bleeding and then a plaster to cover the injection site – these have been laid out in advance. The pen cap is loosely positioned back onto the tip of the pen, then the pen goes into the yellow sharps bin.

{PICTURE 3 location: Legs and injection}

The pressure and clicks offer an insight into attuning to the sensibilities required to learn a new skill and subsequently continue to perform, in this case, an injection. On one hand, it is about informed capacities to listen out for the material reactions and connections, an informed listening that promotes an awareness of the interaction between body and world (Peterson, 2021). On the other, it is the corporal senses of pressure and touch, whereby a skill is developed through “monitoring, sensing, negotiating” to help create patterns of action and routine (Lea, 2009, p. 471). Attunement is key because it involves different senses and movements. The coordination of touch and sound, the felt and the heard. As Böhme (2018) has written, attunement is the interplay of material properties and bodily capacities. To become skilled is to become attuned to the aural, to the touch and the feel. Feeling the way, the processual and the emergent is evident in Mann's (2018) work on hand knitted lace. While a beginner is required to start with instructions, once they are knitting, they must feel their way through attentively and responsively without additional perspicuous guidance. Mann concludes that the skill of hand knitted lace is not about the adherence to traditional rules

nor about transmitting instructions. Akin to this, learning to inject is about finding the feel to navigate oneself through the process.

The time between injections

Monday morning. Another two weeks have passed. Time to remove the injection pen from the fridge. The time between injections slows down the ease at performing the next one. The gap paces out the routine and restricts the easy adoption of the new skills I'm acquiring. It means that I slowly arrange the different things that are required. I practice before each injection with a phantom one, gently placing the injection pen to skin with the cap still on and miming all the actions. I clean the area of skin where I will inject with an antiseptic wipe, arrange the cotton ball, plaster, and pen in a line on the table. The time between injections encourages both a slower sedimentation of the actions and a reduction in the ease and confidence to conduct the next with more pressing concerns covering in the meantime. As Holdsworth (2022a) has written, there are pauses, returns, checking, and re-checking as I fumble my way through the steps and processes.

{PICTURE 4 location: Sharps' bin}

The break also does something else. There is a nervousness each time I begin to prepare for the injection, an apprehensiveness or a slight dread. In the build-up, I wonder if part of this is due to the illicit nature of injections and how they are commonly depicted. The cultural representations of people injecting drugs and other substances that are seen in films, books, and newspapers are about danger, dirt, and disease (Rhodes et al., 2017). However, the pause between my injections also works to emphasise the constituent parts of injecting. The idea of the needle that pierces skin, the medicine that works its way through the body, the cleansing and disposing that are required. The temporal break between actions creates a heightened space of sensation, a space that increases the awareness of the touches, sounds, and feelings of each injection, akin to the unevenness that Lorimer and Lund (2003) have discussed in their work on hill walking. The break disrupts the rhythms of acquiring skills that may have been coalescing, each section becomes more static, restricting the smoothness from element to element. In one sense this engenders a calm moment of the routine. The laying out of the implements, the slow progression through the stages of the injection. However, things do not always go to plan, as the opening vignette attests, sometimes a change in pressure or sound or feeling can result in something going wrong or possibly wrong. Maybe it is not being quite attuned enough or even it is a subtle break in the process. Whatever the cause, the breakdown of part or all, of a new skill can be as concerning as starting a new one in the first place.

Conclusion

My reflections on learning to inject medicine for rheumatoid arthritis explored the procedures and practices of learning a new skill. In doing so, this paper adds to the understanding of the worlding of a chronic disease and the social and cultural geographic concept of learning. Social and cultural geography is uniquely suited to understanding how skills are learnt, developed, and coalesce. In drawing on recent work from this journal and the wider discipline (e.g., Holdsworth, 2022a; Ingold, 2021; Smith 2021) this paper has drawn attention to the way minute and everyday geographies mix with infrastructures, devices, politics, and economics

of health and healthcare. Being able to hold onto the performativity of networks of knowledge emphasises the lively nature of the devices, instructions, and guidance that form part of learning new skills.

The importance of time, stoppages, and the continual re-assembly of learning routines is important. The way that time and space play with the stop-start nature of skill development and of becoming skilled is critical to consider when thinking about under what circumstances learning happens. This is particularly true when creating a new regime of learning that consists of different elements that need to cohere to form a consistent practice. What I have understood from learning to inject is the instability of such learning and the way that from injection to injection some elements work well, and others seemed to become clunky or uncertain. It is these shifts in the assemblages of human-object-sensations that creates challenges each time a new injection is required. This could have implications for developing more personal styles of care rather than generic programmes and procedures.

Central to this is the body. The importance of attuning to sensations and materials cannot be understated. However, it is with and through the body that one learns how to inject. The relationship with feeling how much pressure is required to hold down the pen and the movement and manipulation of the arms and legs to identify the place where the injection needs to go. This is about what Deleuze has called uniting the singularities of a body in a relationship with the specific trajectories, solids, liquids, and sounds that comprise the realm of injections and the associated materiality. The break in times between injections works to slow this down, making it more immediate, more sensual. The sensual, corporeality of learning is suggestive of learning not simply as a meeting between two different dimensions, the body and the tool, but an entanglement of different forces. An entanglement that results in the development of a new skill or group of skills. The implication for learning is that by taking it as a full bodily activity, a full bodily entanglement, there are clear consequences for how we perceive, transmit, and create information.

The themes developed in this paper emphasise how skill and objects, routines and time, interplay to create spaces of skilful learning. These are moments and spaces that are improvised and refined over and over. From finding the best chair when administering an injection to recognising the right amount of pressure and learning to listen for the distinctive sounds the injection pen makes. These are overlapping skills that are developed with different aids and methods of learning (Hunt, 2018; Holdsworth, 2022a). The focus on learning in this paper demonstrates the importance understanding how learning feels. The affects at play in the acquisition of skills draw attention to the way bodies attune to one another, the moments where things cohere their rhythms, relations, and forces. The acquisition of a new skill is always spatially embedded and felt. Social and cultural geography has much to offer our understanding of how people learn and maintain practices. It also holds promise for grasping how people live with a chronic disease.

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