



THE UNIVERSITY *of* EDINBURGH

Edinburgh Research Explorer

Negotiating jurisdictional boundaries in response to new genetic possibilities in breast cancer care

Citation for published version:

Wright, S, Porteous, M, Stirling, D, Young, O, Gourley, C & Hallowell, N 2019, 'Negotiating jurisdictional boundaries in response to new genetic possibilities in breast cancer care: The creation of an 'oncogenetic taskscape'', *Social Science & Medicine*, vol. 225, pp. 26-33.
<https://doi.org/10.1016/j.socscimed.2019.02.020>

Digital Object Identifier (DOI):

[10.1016/j.socscimed.2019.02.020](https://doi.org/10.1016/j.socscimed.2019.02.020)

Link:

[Link to publication record in Edinburgh Research Explorer](#)

Document Version:

Peer reviewed version

Published In:

Social Science & Medicine

General rights

Copyright for the publications made accessible via the Edinburgh Research Explorer is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

The University of Edinburgh has made every reasonable effort to ensure that Edinburgh Research Explorer content complies with UK legislation. If you believe that the public display of this file breaches copyright please contact openaccess@ed.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.



Accepted Manuscript

Negotiating jurisdictional boundaries in response to new genetic possibilities in breast cancer care: The creation of an 'oncogenetic taskscape'

Sarah Wright, Mary Porteous, Diane Stirling, Oliver Young, Charlie Gourley, Nina Hallowell



PII: S0277-9536(19)30087-5

DOI: <https://doi.org/10.1016/j.socscimed.2019.02.020>

Reference: SSM 12169

To appear in: *Social Science & Medicine*

Received Date: 20 August 2018

Revised Date: 12 January 2019

Accepted Date: 12 February 2019

Please cite this article as: Wright, S., Porteous, M., Stirling, D., Young, O., Gourley, C., Hallowell, N., Negotiating jurisdictional boundaries in response to new genetic possibilities in breast cancer care: The creation of an 'oncogenetic taskscape', *Social Science & Medicine* (2019), doi: <https://doi.org/10.1016/j.socscimed.2019.02.020>.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Title:

Negotiating jurisdictional boundaries in response to new genetic possibilities in breast cancer care: the creation of an ‘oncogenetic taskscape’.

Author list and affiliations:

Sarah Wright¹, Mary Porteous², Diane Stirling², Oliver Young³, Charlie Gourley^{2,4} Nina Hallowell⁵

¹Usher Institute of Population Health Sciences and Informatics, University of Edinburgh, Edinburgh, UK.

²MRC Institute of Genetics and Molecular Medicine, University of Edinburgh, Edinburgh, UK.

³Edinburgh Breast Unit, Western General Hospital, Edinburgh, UK.

⁴Cancer Research UK Edinburgh Centre; MRC Institute of Genetics and Molecular Medicine, University of Edinburgh, Edinburgh, UK.

⁵Ethox Centre and Wellcome Centre for Ethics and Humanities, Nuffield Department of Population Health, Big Data Institute University of Oxford

Corresponding author details:

Dr Sarah Wright
Research Fellow
School of Health in Social Science
Room 2.09
24 Buccleuch Place
The University of Edinburgh.

Email: S.J.Wright@ed.ac.uk

Tel: 0131 6 504 332

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24

ABSTRACT

Changes in the nature and structure of healthcare pathways have implications for healthcare professionals' jurisdictional boundaries. The introduction of treatment focused *BRCA1* and 2 genetic testing (TFGT) for newly diagnosed patients with breast cancer offers a contemporary example of pathway change brought about by technological advancements in gene testing and clinical evidence, and reflects the cultural shift towards genomics. Forming part of an ethnographically informed study of patient and practitioner experiences of TFGT at a UK teaching hospital, this paper focuses on the impact of a proposal to pilot a mainstreamed TFGT pathway on healthcare professionals' negotiations of professional jurisdiction. Based upon semi-structured interviews ($n=19$) with breast surgeons, medical oncologists and members of the genetics team, alongside observations of breast multidisciplinary team meetings, during the time leading up to the implementation of the pilot, we describe how clinicians responded to the anticipated changes associated with mainstreaming. Interviews suggest that mainstreaming the breast cancer pathway, and the associated jurisdictional reconfigurations, had advocates as well as detractors. Medical oncologists championed the plans, viewing this adaptation in care provision and their professional role as a logical next step. Breast surgeons, however, regarded mainstreaming as an unfeasible expansion of their workload and questioned the relevance of TFGT to their clinical practice. The genetics team, who introduced the pilot, appeared cautiously optimistic about the potential changes. Drawing on sociological understandings of the negotiation of professional jurisdictions our work contributes a timely, micro-level examination of the responses among clinicians as they worked to renegotiate professional boundaries in response to the innovative application of treatment-focused BRCA testing in cancer care – a local and dynamic process which we refer to as an 'oncogenetic taskscape in the making'.

25 **Keywords:** *UK; Professional jurisdictions; cancer care; taskscape; genomics; mainstreaming; personalised*
26 *medicine*

27 INTRODUCTION

28
29 Care pathways are locally developed guidelines which outline the order and timing of healthcare
30 that patients receive and the roles and responsibilities of practitioners involved in care provision.
31 These infrastructural technologies came to prominence in the 1980s in North America (Allen
32 2009, 2014) and are now firmly established within modern healthcare (Martin et al. 2017). The
33 potential cost-saving and standardising effects of the introduction of care pathways into
34 healthcare have been widely acknowledged (Martin et al. 2017; Hunter and Segrott 2008; Berg et
35 al. 2000). But while efforts to standardise and promote transparency of practice fit within the
36 contemporary ‘audit culture’ (Strathern 2000), it is recognised that the introduction of care
37 pathways might also create tensions. Casting a critical eye over the care pathway movement,
38 Pinder et al. (2005) note that while the introduction of care pathways might be built upon good
39 intentions and the ideal of rationalised planning, this organisational map making can have
40 negative consequences, not least in relation to healthcare professionals’ perceptions of
41 professional autonomy, and inter-professional jurisdictional boundary negotiations.

42 **Care pathways and the sociology of professions**

43 Abbott’s (1988) work on the social nature of workplace relationships and professional control
44 offers a useful analytical foundation for examination of the fluidity of professional workplace
45 jurisdictions in relation to care pathway development. Elucidating the concept of workplace
46 jurisdiction, Abbott (1988) notes that far from being fixed, a profession’s control, or ownership,
47 of tasks is open to continuous, competitive negotiation. Abbott’s work is, however, concerned
48 with ‘investigating how jurisdictions of entire professional groups vanish or expand over

49 time under internal or external pressure' (Timmermans 2002: 552) and has been criticised for
50 over-simplifying the complexity of workplace jurisdictional negotiations (Macdonald 1995).

51 Sociologically-informed studies examining the impact of workforce change within the NHS in
52 relation to jurisdictional defence and negotiation are numerous, and highlight the mobilisation of
53 occupational legitimacy discourses used by different occupational groups to assert new or
54 established professional jurisdiction in relation to others (Sanders and Harrison 2008; Hunter
55 and Segrott 2008; Nancarrow and Borthwick 2005; Timmons and Tanner 2004; Allen 1997). As
56 Timmons and Tanner (2004) note, examples of boundary disputes include those involving
57 hierarchical jurisdictional negotiations, as well as those conducted among professions with a
58 similar status.

59 While it is suggested that the changes that come with care pathway development can improve
60 inter- professional collaboration and cooperation (Harvey and Currie 2000), they can also be
61 counterproductive, as healthcare professionals react by 'protecting, expanding or closing ranks'
62 around their jurisdictional territory (Huby et al 2014). An example of this is seen in the
63 emergence of new professional roles and the enactment of a form of legitimising discourse, used
64 by professionals – new and old – to try and assert their (new/established) professional
65 jurisdiction in relation to others. For example, Timmons and Tanner investigated the highly
66 charged occupational boundary dispute between theatre nurses and new 'Operating Department
67 Practitioners'. They reported on the demarcation disputes that ensued following the introduction
68 of new professionals (ODPs), and how both groups – the nurses and ODPs – deployed a range
69 of rhetorical strategies in order to defend what they viewed as their jurisdictional territory
70 (Timmons and Tanner 2004).

71 Jurisdictional conflict is not only the result of the introduction of new roles into the NHS, but
72 can also emerge as a result of the implementation of new technologies, which may cause a
73 realignment of jurisdictional boundaries. For example, in his cautionary account of the

74 occupational division of labour between gastroenterologists and surgeons in response to the
75 development of gastrointestinal endoscopy, Zetka suggests that the introduction of endoscopy
76 blurred the 'traditional lines of demarcation' (2001:1507) and triggered conflict between
77 gastroenterologists and surgeons, as the groups vied for control over the technology. But, while
78 much of the existing literature on the sociology of professions details inter- or intra-professional
79 conflict occurring as a result of new possibilities of practice – either the emergence of new roles
80 or the introduction of innovative technologies - there remains relatively little attention paid to
81 the impact of innovative *genetic* technologies on professional jurisdictional negotiations, which
82 seems surprising given the hype and hope that has surrounded this technology since the turn of
83 the century.

84 **Care pathways, professional jurisdictions and genetic technologies**

85 In their qualitative study of the provision of cancer genetic services for hereditary cancer
86 syndromes in Ontario, Canada, Miller et al. (2008) speak of the co-evolution of two parallel
87 professional communities of practice that have emerged in the context of the growing influence
88 of genetics in medicine. Members of these two communities, (genetic counsellors, family
89 physicians, non-genetics physicians such as surgeons, and general practitioners), spoke of either a
90 'genetic vision' of cancer care or, an 'oncogenetic vision'. The genetic vision represented a future
91 characterised by the devolution of day-to-day tasks to other specialists while simultaneously
92 protecting the sovereignty of genetics expertise. Conversely, the oncogenetic vision saw genetic
93 testing as cancer prevention, informing management and treatment and, as such, positioned
94 genetic expertise as 'a supportive element in the core cancer service' (Miller et al. 2008: 158).
95 Miller et al. (2008) note that, in contrast to much of the literature on negotiations of professional
96 jurisdiction, their study is not so much an account of professions in conflict, but rather a
97 demonstration of how heterogeneous communities of practice can emerge in response to the
98 introduction of genetic technologies in clinical practice.

99 Two further studies (Martin et al. 2009; Robins and Metcalfe, 2004) focus on the impact of the
100 integration of genetic technologies into primary care. Discussing the role of general practitioners
101 with specialist interest (hereafter GPSI) in relation to specialist colleagues in tertiary care, Martin
102 et al. (2009) examined how the division of labour between clinical genetics and GPSIs was
103 negotiated at several pilot sites. The study highlighted that both cooperative and less constructive
104 relationships were formed between GPSIs and clinical geneticists and that, while the former were
105 keen to demonstrate their competence in genetic knowledge, the clinical geneticists claimed that
106 only day-to-day immersion in the knowledge field would result in true expertise. In contrast,
107 Robins and Metcalfe's (2004) Australian study focused on the integration of genetics into
108 primary care practices, and found that GPs held ambivalent views, claiming a lack of
109 understanding of genetics, coupled with uncertainty as to the relevance of genetic testing to
110 patient management.

111 Each of these studies teased out central questions about the negotiation of control of genetic
112 technologies among healthcare professionals and highlighted central themes in participant
113 narratives linked to perceptions of expertise and clinical relevance. These themes also came up in
114 our own work as we examined the professional jurisdictional negotiations that were triggered by
115 the proposal to mainstream the pathway for the delivery of 'treatment-focused' *BRCA1* and 2
116 genetic testing (hereafter TFGT) for newly diagnosed breast cancer patients in oncology.
117 Bringing together the views of surgeons, medical oncologists and genetics team members as they
118 prepared for the mainstream pilot, our study contributes new insights into how innovative
119 applications of existing BRCA testing technology influenced occupational divisions of labour as
120 this group of professional contemplated incorporating genetic testing in their clinical practice.

121 **A note on 'treatment-focused genetic testing' for *BRCA1* and *BRCA2* gene mutations**

122 Dominantly inherited *BRCA1* and *BRCA2* gene mutations are known to be associated with
123 heightened risk of developing breast cancer and ovarian cancer (Kuchenbaecker et al. 2017). Due

124 to technological advances in, and decreasing costs of, gene sequencing in recent years (Trainer et
125 al. 2010), and new evidence from clinical trials of targeted treatments in *BRC A* mutation positive
126 women (George et al. 2017), *BRC A* testing has expanded from its predictive and diagnostic
127 functions to inform personalised cancer treatment plans (NICE 2013). TFGT has the goal of
128 stratifying patients according to their *BRC A* mutation status and targeting their treatment as a
129 result. This recent application of *BRC A* testing offers patients streamlined treatment pathways,
130 particularly where TFGT is offered by cancer specialists (surgeons or medical oncologists) within
131 mainstream cancer care.

132

133

METHODS

134

Data collection

135 Findings presented herein originate from a larger, ethnographically-informed study of patient
136 and practitioner experiences of TFGT at one UK teaching hospital, which sought to examine
137 individuals' experiences of the shift towards the mainstreaming of genetics into routine cancer
138 care. In their introduction to a special collection on hospital ethnography van der Geest and
139 Finkler note that 'possibilities for anthropological research in hospitals vary', (2004: 1999) due to
140 differing cultural norms of privacy and patient well-being – concerns which are managed through
141 ethical review boards. We use the term 'ethnographically-informed' to describe our research in
142 order to indicate the adaptation of traditional ethnographic methods, specifically, participant
143 observation that we undertook in this study. Our observations were structured and limited to
144 certain spaces and, as such, offer an example of Wind's reworking of participant observations as
145 'negotiated interactive observations': 'what happens when you are doing fieldwork without at the
146 same time assuming that you become one of "them"' (2008: 87). In this paper, we focus
147 exclusively on data from the breast cancer care pathway, at a time when it was preparing to pilot
148 a mainstreamed model (see Figure 1 for current and proposed pathways). Captured during the

149 period of negotiation and early implementation of the new pathway, our findings report the
150 anticipatory views of those working in breast cancer care.

151 Fieldwork was conducted by SW in 2017 and involved twice-weekly attendance at the breast
152 multidisciplinary meetings (MDM) over a six-month period, with most meetings lasting between
153 2-3 hours. Despite being structured and limited to the MDM, observations allowed SW to
154 examine the processes of patient triage and inter-professional communication pertaining to the
155 proposed mainstream pathway. Furthermore, observations allowed SW to become known to the
156 clinicians enabling the successful recruitment of practitioners to the study. Nineteen semi-
157 structured interviews were conducted with clinicians involved in breast cancer care. Participants
158 were identified through contact with key clinical gatekeepers (in surgery and the genetics team).
159 SW emailed potential participants an invitation, information sheet, and expression of interest
160 form. Interview participants included six Breast Surgeons and a breast care nurse specialist (BS1-
161 7) who were responsible for triaging patients for onward referral to the genetics team, six
162 Medical Oncologists (MO1-6) who were about to undergo training and start offering TFGT to
163 breast cancer patients, and six members of the Clinical Genetics team (CG1-6) who currently
164 offer TFGT to all breast patients fitting referral criteria. All interviews were digitally recorded.
165 The University of Edinburgh Research Ethics Committee granted ethical approval.

166 **Data Analysis**

167 We conducted a thematic analysis of fieldwork materials (transcripts and field-notes). We first
168 familiarised ourselves with the data, listening to audio files and reviewing our transcripts and
169 field-notes (Pope, Ziebland and Mays 2000). SW and NH discussed emerging ideas and themes
170 at regular meetings before independently coding the transcripts using NVivo11 software (QSR
171 International Pty Ltd., 2015). Codes, and subsequent categories, were inductively and deductively
172 determined (Maxwell 2012), that is, we were influenced both by *a priori* research questions (for
173 example, seeking to understand clinicians' experiences of providing TFGT), as well as

174 recognition of new insights (for example, learning of the plans to mainstream the breast care
175 pathway). While consideration of occupational boundaries was not the initial focus of our study,
176 it nevertheless became a strong thread in our participant narratives, as they spoke of the plan to
177 mainstream the breast care pathway.

178 FINDINGS

179 **Figure 1 about here**

180

181 **TFGT and the renegotiation of professional jurisdictional boundaries in the context of** 182 **breast cancer care**

183 When we commenced this research, patients with breast cancer were offered TFGT in a
184 standard care pathway. This meant that patients were triaged by their surgeons during their first
185 appointment in order to determine whether they TFGT was appropriate. Triaging criteria
186 included: age, family history (if known) and tumour type. Eligible patients were referred to
187 clinical genetics where they received (expedited) pre-test counselling and *BRCA* testing, which
188 commonly would comprise of a 45 minute counselling session, followed by a blood test,
189 performed by the genetic counsellor. The genetic counsellor would then be responsible for
190 sending the blood sample to the hospital laboratory, from where it would be sent on to the
191 national laboratory for processing. Results of the test would then be returned to the genetics
192 team. Only those identified as carrying a pathogenic mutation or Variant of Uncertain
193 Significance (VUS) – a result which necessitates the interpretation of complex results - would be
194 invited back to the genetics clinic to discuss their result and initiate a familial cascade. The timing
195 of TFGT in relation to treatment varied between patients, depending on whether they had neo-
196 adjuvant chemotherapy or conservative surgery (see fig 1).

197 This standard pathway, based upon triage and, where appropriate, onward referral to clinical
198 genetics for testing, established and reified ‘occupational jurisdictions’ (Hunter and Segrott 2014)
199 - the roles and responsibilities of surgeons, medical oncologists and the genetics team in their
200 daily practice. As one of the genetics team members said:

201 *‘Our role really is to go through the testing so that they can understand the implications of being tested*
202 *and the possible outcomes... We have to very much take into consideration that this test result can*
203 *impact the family and this is one of the things that I feel is really important so that they know that*
204 *having a genetic test result can mean that their condition, their diagnosis can maybe effect other family*
205 *members and other family members will be able to be tested and other family members might be at risk’*
206 (CG1).

207 While the genetics team were concerned with, both, the individual patient and their family
208 members, the medical oncologists and surgeons, in contrast, described themselves as primarily
209 focused on treating individual patients:

210 *[The oncologists’] area of work is personalised medicine and, hence, their focus is on individualised care.*
211 *It should not be about treating of a disease but, rather, it is about treating a patient (notes from*
212 *interview with MO2).*

213 *We don’t say too much about the, you know, the implications for the other family because, you know,*
214 *we’re here to treat cancer’ (BS6).*

215 During our research the clinical genetics team actioned a plan to pilot a mainstreamed pathway at
216 the hospital; this entailed shifting the responsibility for consenting and *BRC*A testing from the
217 genetics team to the surgeons and medical oncologists at the breast unit. This stage of ‘process-
218 mapping’, that is, deciding what should happen and when in the new pathway (Harvey and
219 Currie 2000), demanded renegotiation of professional jurisdictions, as the genetics team sought
220 to devolve the responsibility for consenting patients for TFGT to other practitioners. The design

221 and implementation of the pathway was achieved through adaptation of the Royal Marsden's
222 'mainstreaming cancer genetics project' to the local context, a job which was taken on by
223 members of the genetics team. While this was an innovation, it was not the first time that the
224 genetics team had introduced a mainstreamed approach to TFGT at the study site, as the ovarian
225 cancer care pathway had been mainstreamed several years prior to our fieldwork. However,
226 unlike the ovarian pathway, which delegated consenting and testing, and the interpretation and
227 sharing of results with patients, the proposed breast pathway would see the genetics team
228 maintaining jurisdiction over results interpretation and informing patients of their BRCA status.

229 **Contracting work boundaries: the clinical genetics team's views on mainstreaming**

230 The introduction of TFGT had had profound implications for the genetics team, as the
231 incorporation of this technology into their practice had meant that their workload had increased
232 in recent years to a point where the service was struggling to cope. As a consequence, the
233 genetics team were actively encouraging other professionals to share some of the workload
234 associated with TFGT – an example of what Nancarrow and Borthwick (2005) refer to as
235 'horizontal substitution', which is advantageous when services are at capacity. The proposal to
236 relinquish taking consent for genetic testing in this instance was justified by some genetics team
237 members as related to the indistinctness of professional responsibilities when it came to TFGT,
238 as CG3 said '[just] because a patient has a genetic cancer doesn't mean that they only belong to
239 genetics: they have cancer, they need their treatment'. As Miller et al. (2008) found in their study
240 of those involved in genetic cancer care in Ontario, there was a sense among some practitioners
241 that the mainstreaming of cancer care was the future, and that the genetics clinic was not
242 necessarily the right place for this care provision. Indeed, as CG3's comment highlights, there
243 was unresolved tension raised by TFGT, primarily because there was uncertainty about where
244 these patients would belong, and who should be responsible for them.

245 Role diversification, or the adoption of a new role by a professional group (Nancarrow and
246 Borthwick 2005), - in this case the surgeons/medical oncologists adopting the role of consent
247 taker - was regarded by the genetics team as a means to divest themselves of a task so that they
248 could refocus their attention on the familial implications of testing:

249 *I think the genetic counselling role obviously is of high importance when we're looking at family and I*
250 *don't feel that's going to go I think that's always going to be the most important thing dealing with the*
251 *management of the family' (CG2).*

252 As noted above, the importance of looking beyond the individual and considering *the family*
253 distinguishes the role of clinical genetics from that of other professionals in the breast cancer
254 pathway. Indeed, the expertise of clinical genetics extends beyond the patient and the pathology,
255 linking patient and kin through a relationship of risk (Hallowell 1999). Crucially, this sense of
256 professional jurisdiction extending beyond the individual patient to their family offered a
257 justification for why the genetics team appeared to be advocating for mainstreaming TFGT.

258 *'We weren't set up for it, they're [genetic counsellors] on their knees, it will return us to actually being able to*
259 *do our own job properly. I don't think it takes away the role or anything, I think there's all the pre-*
260 *symptomatic testing, which is what we're really supposed to be about' (CG4).*

261 As CG4 observed, mainstreaming this service would allow the clinical genetics team to return to
262 their primary role of counselling and supporting those patients, specifically, those identified as
263 mutation positive or as carrying VUS. In addition, the genetics team would be able to focus on
264 not only the patients, but also the tasks of identifying and supporting family members
265 undergoing pre-symptomatic testing.

266 In summary, the proposal to mainstream TFGT potentially narrows the jurisdiction of the
267 genetics team, allowing them to re-establish the boundaries around their specialist jurisdiction,
268 while simultaneously necessitating the expansion of surgeons and/or medical oncologists'

269 jurisdictions, as they assume responsibility for offering TFGT and consenting patients. In the
270 following section we consider how these non-genetic specialists responded to the possibility of a
271 mainstreamed pathway, in relation to their workload, realms of expertise and perceptions of
272 relevance of TFGT to clinical practice.

273 **Expanding work boundaries: Breast oncologists' and surgeons' reactions to** 274 **jurisdictional renegotiations**

275 Our findings indicate that breast surgeons and medical oncologists had differing opinions about
276 the implementation of a mainstream pathway. The medical oncologists who participated in our
277 study appeared keen to complete the online training provided to them by the genetics team, so
278 that they could start integrating the consenting of patients into their clinical practice. The reasons
279 that medical oncologists gave for their enthusiasm for participating in the mainstream pathway
280 included: their belief in their ability to take on this work, both in terms of expertise and
281 workload, their understandings of the clinical relevance of TFGT and, finally, their sense that
282 they were better suited to the task than their surgical colleagues. Primarily, the medical
283 oncologists recognised that they had a number of skills - namely, discussing risks and benefits in
284 oncology- that would suit the task of consenting patients for TFGT:

285 *I don't feel uncomfortable in discussing it in broad terms, so in terms of consenting the patient...I don't*
286 *feel uncomfortable about that. I mean we have a lot of similar type of discussions, around other aspects of*
287 *oncological care that are also... a question of balancing unquantified risks and unquantified benefits, or*
288 *risks and benefits that haven't got precise measures. So I think I can consent people meaningfully for the*
289 *genetics test, which is probably the key question as to whether it's right to mainstream or not' (MO3).*

290 The experience of communicating uncertainty about treatment and prognosis to patients meant
291 the medical oncologists viewed consenting patients for TFGT as falling well within their
292 professional jurisdiction. This finding echoes Miller et al. who found that those healthcare
293 professionals who espoused an oncologic vision of care saw undertaking some roles previously

294 under the purview of genetic professionals as a ‘natural extension of their work’ (2008: 158).
295 Furthermore, we found that some medical oncologists felt that offering TFGT was a more
296 appropriate task for them than their surgical colleagues:

297 *‘You need this operation, these are the risks’.* When it comes to discussing chemotherapy, and say
298 *adjuvant chemotherapy, it’s really common that we have a kind of discussion, “well, here’s the pros and*
299 *here’s the cons and it’s somewhere in between” and it’s a grey, grey area discussion we can’t perfectly*
300 *quantify. So our familiarity with that type of conversation might be greater [than the surgeons]’* (MO3).

301 Thus, the medical oncologists deployed legitimacy discourses to position themselves as
302 competent and better suited for this work than their surgical colleagues (see Sanders and
303 Harrison, 2008). Finally, the medical oncologists were clear about the clinical utility of the TFGT
304 result for the treatment of their patients:

305 *To know the BRCA status of a patient ... ‘determines the treatment’.* The oncologists request an urgent
306 *result and, usually, they will get the result within 4 weeks. This is by mid-chemo, and the outcome is*
307 *important because they can change the chemo regime, if necessary. If a patient comes back BRCA + then*
308 *‘Carboplatin’ will be added into the chemotherapy. Therefore, knowing the BRCA status of the patient*
309 *before neoadjuvant therapy is completed is absolutely vital for the care they are providing patients*
310 *(interview notes MO2).*

311 Knowing the BRCA status of a patient is, therefore, crucial for providing appropriate
312 oncological care and, consequently, there was strong interest among the medical oncologists to
313 learn this information as soon as possible. Despite this logic, it was the case that medical
314 oncologists may not, in fact, know their patient’s BRCA status at the time of commencing
315 chemotherapeutic treatment. Consequently, mainstreaming the pathway presented the
316 opportunity for the medical oncologists to gain control over the timing of testing for patients
317 which would support them in their clinical practice. However, it should be noted here that
318 although the shift to a mainstreamed model for TFGT in breast cancer care had seen medical

319 oncologists expanding their jurisdiction, mainstreaming the pathway would still require the
320 genetic team to interpret the results of TFGT because in this locally designed mainstreamed
321 model, genetic results would come from the laboratory to the genetics team who would then
322 report back to the clinician and patient. So, while the genetics team were instrumental in getting
323 medical oncologists to take on the role of consenting and testing patients, it remained the case
324 that they would maintain intellectual sovereignty over the task of interpreting lab results. This
325 echoes with the findings of both Martin et al. (2009) and Miller et al. (2008), who similarly found
326 that while roles and responsibilities shifted in response to the new technological possibilities of
327 the genomics era, this devolution was not all encompassing, as competing visions of the future
328 of genetics in medicine and medical practice were negotiated. Arguably, the negotiations about
329 the mainstreamed care pathway at our field-site can be seen as a momentary opening up of inter-
330 professional boundaries, which was intended to facilitate the ensuing reinforcement (as opposed
331 to de-territorialisation) of the genetics team's realm of expertise.

332 Contrary to the oncologists, all of the surgeons expressed reticence to expand their professional
333 jurisdiction to include the consenting of patients for TFGT. Surgeons' ambivalence appeared to
334 be explicitly linked to their concerns about workload management, lack of certainty around
335 clinical relevance, and the need to maintain a distinct professional jurisdiction. Indeed, while one
336 of the surgeons noted that mainstreaming demanded *'identifying who needs testing and getting it done as*
337 *quickly and as efficiently as possible and sharing the pain of who does it'* (BS6), none of the surgeons
338 suggested that they would be able, or willing, to participate in delivering the new pathway. As
339 BS1 said, *'we're really in a clinic dealing with people with lumps and we're looking to diagnose their lumps rather*
340 *than do all the genetic screen'*.

341 It appeared that the surgeons' ambivalence about mainstreaming might also have been
342 influenced by a misunderstanding as to what this new care pathway would involve. Observations
343 at one of the MDMs indicated surgeons were unclear about the proposal:

344 *One of the surgeons interrupted the other and said that they would have to counsel the patient, rather*
345 *than triaging and sending them on to genetics. This caused another to say 'I thought clinical genetics were*
346 *meant to counsel', to which an oncologist said, no, they were moving towards a 'mainstreamed' service,*
347 *'like ovarian'. There was clearly some confusion regarding the proposed changes (Field-notes from*
348 *breast MDM 14/03/2017).*

349 Unsure about what they were being asked to do, the surgeons seemed to resist the idea of
350 mainstreaming, regarding it as too onerous - adding an unmanageable workload to their already
351 over-stretched service:

352 *'So, you know ... if you look at what we are doing as clinicians you're doing more and more on more*
353 *and more patients. And if we've then got to prepare the patients for genetic testing, and the view of the ...*
354 *genetic counsellors is if you have set criteria of which you can test people then to speed it up we can actually*
355 *take the blood and counsel the patients, and then send it off for testing. I'm not sure we can take on much*
356 *more realistically. I've got like five things open. I've got my clinic open. I've got my you know, my emails,*
357 *my calendar open, I'm booking operation dates. I'm-, some days I'm seeing 20 in a morning....' (BS2).*

358 Like the orthopaedic surgeons in Norris' (2001) study of occupational boundary maintenance in
359 musculo-skeletal treatment, the legitimacy claims made by the breast surgeons about their
360 position and jurisdictional boundaries were framed around concerns about capacity. There was,
361 however, a further explanation for the surgeons' lack of enthusiasm about the mainstreamed
362 pilot, namely, they did not regard TFGT as integral to their practice of treating cancer. Instead, it
363 appeared that the surgeons regarded genetic testing as primarily a means to *prevent future cancers*
364 *from occurring*. In other words they did not see this new application of genetic testing as *useful*
365 (Hedgecoe, 2008) in their day-to-day care of patients. In his study of the implementation and
366 uptake of pharmacogenetic testing, Hedgecoe suggests that it is important to interrogate 'how
367 "useful" specific tests are in specific contexts, [in] a way that places the onus squarely back on
368 the proponents of these technologies to justify their adoption by clinicians' (2008:184). This

369 emphasis on the usefulness of genetic testing and pharmacogenetics resonates somewhat with
370 the responses from the surgeons in this study insofar as they were sceptical about the test's
371 clinical utility for their practice. Where our findings diverge from Hedgecoe, however, is our
372 consideration of how the new technology of TFGT, in the context of wider policy and cultural
373 shifts towards the mainstreaming of genomics, worked to force jurisdictional negotiations among
374 study participants. Yet, while the surgeons questioned the utility of TFGT for their practice, they
375 nevertheless recognised that mainstreaming BRCA testing would benefit patients:

376 *I just think it needs to become more part and parcel of breast cancer treatment, and it needs to become*
377 *much more routine and we need to work out a way in which it's easy for us to, easier, quick for it to be*
378 *done **by the right people**, in a timely way' (our emphasis BS6).*

379 Crucially, it seemed that the surgeons did not regard themselves as being the right people for the
380 task and, in fact, it appeared that both the genetics team and medical oncologists were
381 sympathetic to the surgeons' position. As we have seen, medical oncologists regarded themselves
382 as having more appropriate skills than the surgeons to take on consenting and testing while, as
383 one member of the genetics team noted, '*...if I had to put a fair interpretation, I think they're [surgeons]*
384 *very busy'* (CG4).

385 **On speciality champions as 'boundary spanners'**

386 Up to this point we have focused on the responses of surgeons and medical oncologists in
387 relation to the proposal put forward by the genetics team to mainstream the breast care pathway.
388 Referring to what Anteby et al (2016) call the 'doing lens' of occupational jurisdictional
389 negotiations, we have seen the different ways in which these stakeholders have indicated their
390 interest in, or ambivalence towards, the pilot. The responses of medical oncologists and
391 surgeons have been linked to considerations of expertise, relevance, and workload raised by
392 participants. For example, as evidenced above, the enthusiasm expressed by the medical
393 oncologists fits with the general interest in personalised medicine that runs through the field of

394 oncology (Hamburg and Collins 2010). Yet, there was something more in our participants'
395 accounts, namely, the interlinked consideration of the impact of professional disconnectedness
396 constructed by virtue of the existing care pathway, and the role of speciality champions in
397 facilitating cooperative communication. Our data suggest the negotiations that take place at times
398 of pathway change can be conceptualised spatially, troubling established professional boundaries
399 and hierarchies (Bleakley 2013). It was within this context of uncertainty at our field-site that
400 specialty champions were viewed by some to be crucial in turning the pilot care pathway (a
401 'boundary object') into a 'boundary-object-in-use' (Allen 2009), that is, as acceptable to
402 stakeholders and successfully implemented.

403 Allen notes that care pathways are symbolic 'boundary objects', which span 'several social worlds
404 and fulfil a role in structuring relations between them' (Allen 2009: 355). Consequently, care
405 pathways reify professional jurisdictions, and have the capacity to physically separate
406 practitioners, as tasks are conducted in assigned spaces. In our study, the jurisdictional silos
407 created by the standard care pathway were reinforced by the physical separateness of the breast
408 unit from the genetics department, this physical space acting as a barrier to cooperation and
409 mutual understanding. As one of the genetic counsellors reflected:

410 *'It's hard, because it would make quite a lot of sense to co-locate. Because if you bump into people in the*
411 *tearoom that's when you get to know them, isn't it? And you work well together when you know more*
412 *about each other and what you do, what constraints there are on what you're doing and why you seem to*
413 *be acting in a bizarre way. You know, you just get a better sense of what, where people are coming from'*
414 (CG5).

415 It was not only the genetics team who felt this way. BS2 also talked about the need for further
416 integration across the specialities, noting that the genetics clinic is physically removed from the
417 breast unit, thereby limiting the possibility of frequent face-to-face interaction:

418 *'I think, in other centres I've worked in, the geneticists are more integrated into the team on the ground.*
419 *Whereas genetics here are removed from us. Everything is done by correspondence. **We never see***
420 ***any... the whites of anybody's eyes'** (our emphasis BS2).*

421 Of particular interest, however, is that despite being located away from the genetics department,
422 a collaborative cooperation was established between the genetic counsellors and medical
423 oncologists. Our data provide insights into participants' explanations for this which go beyond
424 concerns of expertise, workload and clinical relevance to focus on the role of a specialty
425 champion in medical oncology. As one of the genetics team members noted:

426 *'I think the oncologists will but that's just because of the experience with the ovarian and that somebody*
427 *like [name]. I think [name] is likely to follow through on this, and [name] is interested. So there's, I*
428 *think those are, those are people that understand, they genuinely seem to want to do it' (CG4).*

429 We suggest, thus, that the speciality champion might be viewed as a 'boundary spanner' – an
430 individual whom, in promoting collaboration and overcoming the challenges of both physical
431 separateness and communicative barriers which are reified in the standard pathway – is central in
432 relation to 'the emerging cross-boundary practices-in-the-making' (Kislov 2018: 830). Put simply,
433 the speciality champion as 'boundary spanner' facilitates the creation of a momentary dynamic
434 communicative space wherein new roles and responsibilities could be negotiated. While there is
435 little mention of champions in the literature (Keshet et al 2013), in their role as 'boundary
436 spanners' they can be understood as pathway facilitators, integral to the successful
437 implementation of new pathways (Hunter and Segrott 2008; Harvey and Currie 2000). Certainly,
438 in our research, we found that key actors appeared fundamental to the success of the
439 mainstreaming of *BRCA* testing within gynaecology (Wright et al 2018) and also the
440 implementation of the breast care pilot. Specialty champions might then be considered as
441 conduits for change, 'boundary spanners', facilitating the evolution of new pathways – in our

442 case, the making of an oncogenetic ‘taskscape’ (Ingold, 1993) for TFGT, which we will discuss
443 below.

444

445 DISCUSSION

446 This study offers timely examination of the reconfiguration of professional jurisdictions amongst
447 surgeons, medical oncologists and genetics team members in response to the implementation of
448 a proposal to pilot a mainstreamed pathway for the delivery of TFGT to breast cancer patients at
449 a regional hospital. While significant attention has been given to the relationship between new
450 genetic technologies and individual (often female patient) responsibility (Arribas-Ayllon 2016),
451 we have focused here on the relationship between genetics and *professional* responsibility, as
452 innovative applications of technologies are integrated into clinical practice. As our findings
453 demonstrate, this integration in different specialities results in the renegotiation of work
454 territories and jurisdictional boundaries, which contribute to relatively scant research on the
455 emergence of cooperative, *generative* occupational relations (in this case, between the medical
456 oncologists and genetics team) in the context of jurisdictional negotiations (Anteby et al 2016).
457 Drawing upon theories of professional boundary-making our data suggests that the introduction
458 of TFGT elicits multiple responses in relation to shifting boundaries of expertise and practice:
459 defending positions (surgeons); a willingness to expand the boundaries (oncologists) and; a desire
460 to re-assign tasks and re-establish boundary of expertise and practice (genetics team).

461 Crucially, our research offers an example of jurisdictional negotiations that are not hinged upon
462 competition, encroachment and defence of territory – the common concerns of sociological
463 studies of professions (see Zetka 2001). Rather, our findings offer a different, and intriguing,
464 example of a profession (clinical genetics) willingly relinquishing tasks to others, and the
465 response of surgeons (ambivalence, and maintenance of existing jurisdictions) and medical
466 oncologists (enthusiasm, and expansion of their role) to this offer. The genetics team’s efforts to

467 reassign a subset of their tasks, should not, however, be seen as professionally cavalier. Quite the
468 contrary, in handing tasks to others, the genetics team were acting in what they saw as their, and
469 their patients', best interests - to re-establish clear boundaries around their jurisdiction, and re-
470 assert their expertise. The introduction of 'TFGT' had made their jurisdiction unbounded.
471 Relinquishing less-specialised tasks to others offered the genetics team the opportunity to return
472 to clearer jurisdictional expertise. The actions on the part of the genetics team could, thus, be
473 understood as an active 'discarding of unwanted tasks to another provider' of similar training
474 (Nancarrow and Borthwick 2005: 905), a process which can result from mutually agreed transfer,
475 or be stifled by conflict. As we have seen in relation to our study, there was enthusiasm from the
476 medical oncologists to expand their jurisdiction, linked to an understanding that this made
477 pragmatic sense (Nancarrow and Borthwick), while the surgeons remained distant.

478

479 In summary, our data suggest that the question of professional jurisdictions in relation to the
480 delivery of genetics in medicine generally, and cancer care specifically, is not simply about turf
481 battles (Miller et al. 2008). Instead, the question that should be asked is what genetic technologies
482 can achieve in clinical practice (Miller et al. 2008; Hedgecoe 2008). As our study, and others'
483 (Hamburg and Collins 2010; Miller et al. 2008) have shown, oncology appears to be a specialism
484 where the uptake of mainstreaming is welcomed, this almost certainly because medical
485 oncologists regard the streamlining of genetic/genomic testing as a clear, practice-focused
486 rationale, informed by the results of clinical trials.

487 **The making of an oncogenetic taskscape**

488 Thus far, this paper has presented the findings from our study pertaining to the views and
489 experiences of healthcare practitioners in relation to a proposed, mainstreamed 'TFGT' pathway
490 for breast cancer patients at the field-site hospital. The data suggest our interviewees fall into two
491 discrete groups – those who viewed themselves as collaborators in the mainstream pathway (the

492 medical oncologists and the genetics team), versus those who did not (the surgeons). Ingold's
493 (1993) 'taskscape', a concept which refers to an ensemble of mutually interlocking tasks and
494 related activities that forge dynamic connections- collaborations- between people, can be seen as
495 a useful lens through which to interrogate the relationship between care pathway development
496 and the professional jurisdictional negotiations at our field-site. Indeed, the design and
497 implementation of the mainstreamed care pathway for breast cancer patients is an ongoing social
498 process, which hinges upon the forging of productive and collaborative inter-professional
499 relationships in order to successfully create and maintain this new pathway for care provision.

500 Drawing on Ingold's (1993) concept, we suggest that our findings might be understood as an
501 'oncogenetic taskscape in the making'. First, we refer to the oncogenetic taskscape as a way to
502 conceptualise the dynamic social process of professional jurisdictional negotiations that were
503 ongoing during our fieldwork. In these discussions, the genetics team members and medical
504 oncologists were united in their opinion that TFGT was a *diagnostic* test and, therefore, should fall
505 under the jurisdictional responsibility of the oncologists. This echoes somewhat the community
506 of practice that espoused an oncogenetic vision of cancer care in Miller et al. (2008). Yet, our
507 oncogenetic taskscape differs from the oncogenetic vision described by Miller et al. because in
508 our study the medical oncologists had an enduring recognition of the genetics team's expertise,
509 most notably in relation to the interpretation of complex results (i.e. genetic variants of uncertain
510 significance). Thus, the oncogenetic taskscape recognises that neither party see transferring the
511 task of offering TFGT to oncology as challenging the genetics team's expertise. Thus, while it
512 has been suggested that the future of genetic medicine is in devolved, diasporic pathways, located
513 in disease specific areas of care provision (Guttmacher, Jenkins and Uhlmann 2001), our study
514 offers a different outlook. The oncogenetic taskscape emphasises the creation of an inter-
515 professional collaboration which, while seeing the transferal of certain tasks to disease specific
516 areas (in our case, oncology), as Guttmacher et al. (2001) predicted, the speciality of clinical

517 genetics nevertheless maintains sovereignty over genetic expertise in the interpretation of
518 complex results and concerns of the family.

519 To our oncogenetic taskscape, we add ‘in the making’, and in so doing acknowledge Pinder et
520 al’s (2005) assertion that the process of creating care pathways (the cultural cartography of which
521 they write) must be regarded as a process that is ‘always in the making’ (2005: 776). We similarly
522 emphasise ‘in the making’ to indicate that the negotiation of professional jurisdiction associated
523 with the design of the new mainstreamed pathway is co-evolving, ongoing and, as such,
524 unknown. Indeed, as Hunter and Segrott note in their review of the use of clinical pathways by
525 nurses and midwives, despite their status as tools which map things out clearly, care pathways, in
526 their implementation, often represent a ‘journey into the unknown’ for those involved (2008:
527 623). Furthermore, the implementation of new technologies or, in this case, new applications of
528 existing technologies, not only require adjustments to work routines, but also unfold ‘along a
529 course that is a bit uncertain’ (Zetka 2001: 1512). Thus, we suggest that the ‘oncogenetic
530 taskscape in the making’ represents, both, the collaborative space forged by medical oncologists
531 and genetic team members who, buoyed by a shared understanding of the potential benefits of
532 the new pathway, undertook the task of negotiating new jurisdictional boundaries, and the still
533 uncertain character of the pathway, which is yet to transition from pilot phase to official
534 pathway.

535 **Limitations**

536 There are limitations to this study. In the first instance, it captured only the moments of planning
537 and early implementation of the mainstreamed care pathway in breast cancer care at our field-site
538 and so does not speak to the experiences of clinicians and genetics team members as they put
539 their plans into practice, nor does it assess the success, or shortcomings, of the pilot. Certainly,
540 while not viewing substitution as a risk to their professional expertise, it is nevertheless the case
541 that it remains to be seen what the implications of implementation of the mainstream pilot will

542 be for the genetics team. Furthermore, the findings are limited to one location and a particular
543 group of participants. Despite these shortcomings, this study offers an in-depth, contextual
544 examination of the process of change to professional jurisdictions that accompanies the
545 introduction of new technologies and, thus, provides a clear example of how the growing
546 impetus on moving genomics in clinical practice impacts on inter-professional relationships and
547 the provision of care.

548 **Conclusions**

549 This study offers a detailed analysis of the locally negotiated process to implement a
550 mainstreamed TFGT pathway at our field-site. By focusing on professionals' experiences as they
551 negotiate the possibilities of a new, mainstreamed pathway for patients with breast cancer and
552 their respective roles within this, we found that members of different professional groups
553 differed in terms of their willingness to expand their jurisdiction and maintain professional
554 boundaries. Reasons for, either, support for the pilot or lack of enthusiasm linked to issues of
555 perceived clinical relevance of the technology for their clinical practice, and their beliefs about
556 acceptable jurisdictional parameters. Our data suggests that the design and implementation of
557 new pathways in patient care is a processual and dynamic social arrangement, which is on-going,
558 fluid and uncertain. Capturing a period of time wherein negotiations for the pilot were underway,
559 it remains to be seen how this new pathway, and the continued integration of new genetic
560 technologies into standard care more generally, will impact on professional jurisdictional
561 boundaries, inter-professional communications and patient care. In closing, we propose that the
562 *oncogenetic taskscape in the making* is a helpful concept that not only captures ongoing negotiations
563 of the pathway, and the inter-professional dynamics of change-making within the context of the
564 integration of mainstreamed TFGT into the breast cancer care pathway, but also is illustrative of
565 the locally mediated, dynamic jurisdictional negotiations which are likely to arise as a
566 consequence of the integration of genetic technologies into clinical care.

567

568

References

- 569 Abbott, A., 1988. The system of professions: An essay on the division of labour.
- 570 Allen, D., 2009. From boundary concept to boundary object: the practice and politics of care
571 pathway development. *Social Science & Medicine*, 69(3), pp.354-361.
- 572 Allen, D., 2014. Lost in translation? 'Evidence' and the articulation of institutional logics in
573 integrated care pathways: from positive to negative boundary object? *Sociology of health &
574 illness*, 36(6), pp.807-822.
- 575 Anteby, M., Chan, C.K. and DiBenigno, J., 2016. Three lenses on occupations and professions in
576 organizations: Becoming, doing, and relating. *The Academy of Management Annals*, 10(1), pp.183-
577 244.
- 578 Arribas-Ayllon, M., 2016. After geneticization. *Social Science & Medicine*, 159, pp.132-139.
- 579 Berg, M., Horstman, K., Plass, S. and Van Heusden, M., 2000. Guidelines, professionals and the
580 production of objectivity: standardisation and the professionalism of insurance medicine. *Sociology
581 of health & illness*, 22(6), pp.765-791.
- 582 Bleakley, A., 2013. The dislocation of medical dominance: making space for interprofessional
583 care. *Journal of Interprofessional Care*, 27(sup2), pp.24-30.
- 584 George, A., Kaye, S. and Banerjee, S., 2017. Delivering widespread BRCA testing and PARP
585 inhibition to patients with ovarian cancer. *Nature reviews Clinical oncology*, 14(5), p.284.
- 586 Guttmacher, A.E., Jenkins, J. and Uhlmann, W.R., 2001. Genomic medicine: who will practice it?
587 A call to open arms. *American Journal of Medical Genetics Part A*, 106(3), pp.216-222.
- 588 Hallowell, N., 1999. Doing the right thing: genetic risk and responsibility. *Sociology of Health &
589 Illness*, 21(5), pp.597-621.
- 590 Hamburg, M.A. and Collins, F.S., 2010. The path to personalized medicine. *New England Journal
591 of Medicine*, 363(4), pp.301-304.
- 592 Harvey, V., Currie, G., 2000. The use of care pathways as tools to support the implementation of
593 evidence-based practice. *Journal of Interprofessional Care*, 14(4), pp.311-324.
- 594 Hedgecoe, A., 2008. From resistance to usefulness: sociology and the clinical use of genetic
595 tests. *BioSocieties*, 3(2), pp.183-194.
- 596 Huby, G., Harris, F.M., Powell, A.E., Kielman, T., Sheikh, A., Williams, S. and Pinnock, H.,
597 2014. Beyond professional boundaries: relationships and resources in health services'
598 modernisation in England and Wales. *Sociology of health & illness*, 36(3), pp.400-415.
- 599 Hunter, B. and Segrott, J., 2008. Re-mapping client journeys and professional identities: A review
600 of the literature on clinical pathways. *International journal of nursing studies*, 45(4), pp.608-625.

- 601 Hunter, B. and Segrott, J., 2014. Renegotiating inter-professional boundaries in maternity care:
602 implementing a clinical pathway for normal labour. *Sociology of health & illness*, 36(5), pp.719-737.
- 603 Ingold, T., 1993. The temporality of the landscape. *World archaeology*, 25(2), pp.152-174.
- 604 Keshet, Y., Ben-Arye, E. and Schiff, E., 2013. The use of boundary objects to enhance
605 interprofessional collaboration: integrating complementary medicine in a hospital setting. *Sociology
606 of health & illness*, 35(5), pp.666-681.
- 607 Kuchenbaecker, K.B., Hopper, J.L., Barnes, D.R., Phillips, K.A., Mooij, T.M., Roos-Blom, M.J.,
608 Jervis, S., Van Leeuwen, F.E., Milne, R.L., Andrieu, N. and Goldgar, D.E., 2017. Risks of breast,
609 ovarian, and contralateral breast cancer for BRCA1 and BRCA2 mutation carriers. *Jama*, 317(23),
610 pp.2402-2416.
- 611 Kislov, R., 2018. Selective permeability of boundaries in a knowledge brokering team. *Public
612 Administration*, 96(4), pp.817-836.
- 613 Macdonald, K.M., 1995. *The Sociology of the Professions: SAGE Publications*. Sage.
- 614 Martin, G.P., Currie, G. and Finn, R., 2009. Reconfiguring or reproducing intra-professional
615 boundaries? Specialist expertise, generalist knowledge and the 'modernization' of the medical
616 workforce. *Social science & medicine*, 68(7), pp.1191-1198.
- 617 Martin, G.P., Kocman, D., Stephens, T., Peden, C.J., Pearse, R.M. Pathways to professionalism?
618 Quality improvement, care pathways, and the interplay of standardisation and clinical
619 autonomy. *Sociology of health & illness*, 39(8), pp.1314-1329.
- 620 Maxwell, J.A., 2012. *Qualitative research design: An interactive approach* (Vol. 41). Sage publications.
- 621 Miller, F.A., Giacomini, M. and Ahern, C., 2008. Contending visions in the evolution of genetic
622 medicine: the case of cancer genetic services in Ontario, Canada. *Social science & medicine*, 67(1),
623 pp.152-160.
- 624 National Institute for Health and Clinical Excellence (2013) Familial breast cancer: classification,
625 care and managing breast cancer and related risks in people with a family history of breast
626 cancer. NICE guideline [CG164].
- 627 Nancarrow, S.A. and Borthwick, A.M., 2005. Dynamic professional boundaries in the healthcare
628 workforce. *Sociology of health & illness*, 27(7), pp.897-919.
- 629 Norris, P., 2001. How 'we' are different from 'them': occupational boundary maintenance in the
630 treatment of musculo-skeletal problems. *Sociology of Health & Illness*, 23(1), pp.24-43.
- 631 Pinder, R., Petchey, R., Shaw, S. and Carter, Y., 2005. What's in a care pathway? Towards a
632 cultural cartography of the new NHS. *Sociology of health & illness*, 27(6), pp.759-779.
- 633 Pope, C., Ziebland, S. and Mays, N., 2000. Qualitative research in health care: analysing
634 qualitative data. *BMJ: British Medical Journal*, 320(7227), p.114.

- 635 Robins, R. and Metcalfe, S., 2004. Integrating genetics as practices of primary care. *Social science*
636 *& medicine*, 59(2), pp.223-233.
- 637 Sanders, T. and Harrison, S., 2008. Professional legitimacy claims in the multidisciplinary
638 workplace: the case of heart failure care. *Sociology of Health & Illness*, 30(2), pp.289-308.
- 639 Strathern, M. ed., 2000. *Audit cultures: Anthropological studies in accountability, ethics, and the academy*.
640 Psychology Press.
- 641 Timmermans, S., 2002. The cause of death vs. the gift of life: Boundary maintenance and the
642 politics of expertise in death investigation. *Sociology of health & illness*, 24(5), pp.550-574.
- 643 Timmons, S. and Tanner, J., 2004. A disputed occupational boundary: operating theatre nurses
644 and operating department practitioners. *Sociology of Health & Illness*, 26(5), pp.645-666.
- 645 Trainer, A.H., Lewis, C.R., Tucker, K., Meiser, B., Friedlander, M. and Ward, R.L., 2010. The
646 role of BRCA mutation testing in determining breast cancer therapy. *Nature reviews Clinical*
647 *oncology*, 7(12), p.708.
- 648 Van der Geest, S. and Finkler, K., 2004. Hospital ethnography: introduction. *Social science &*
649 *medicine*, 59(10), pp.1995-2001.
- 650 Wind, G., 2008. Negotiated interactive observation: Doing fieldwork in hospital
651 settings. *Anthropology & medicine*, 15(2), pp.79-89.
- 652 Wright, S., Stirling, D., Young, O., Gourley, C., Porteous, M. and Hallowell, N., 2018.
653 Mainstreaming BRCA1 and BRCA2 testing: an interview study of healthcare professionals'
654 views, (Poster) The European Human Genetics Conference 2018, Milan, 16th-19th June 2018.
- 655 Zetka Jr, J.R., 2001. Occupational divisions of labor and their technology politics: The case of
656 surgical scopes and gastrointestinal medicine. *Social Forces*, 79(4), pp.1495-1520.

657

658

659

ACCEPTED MANUSCRIPT

ACKNOWLEDGEMENTS

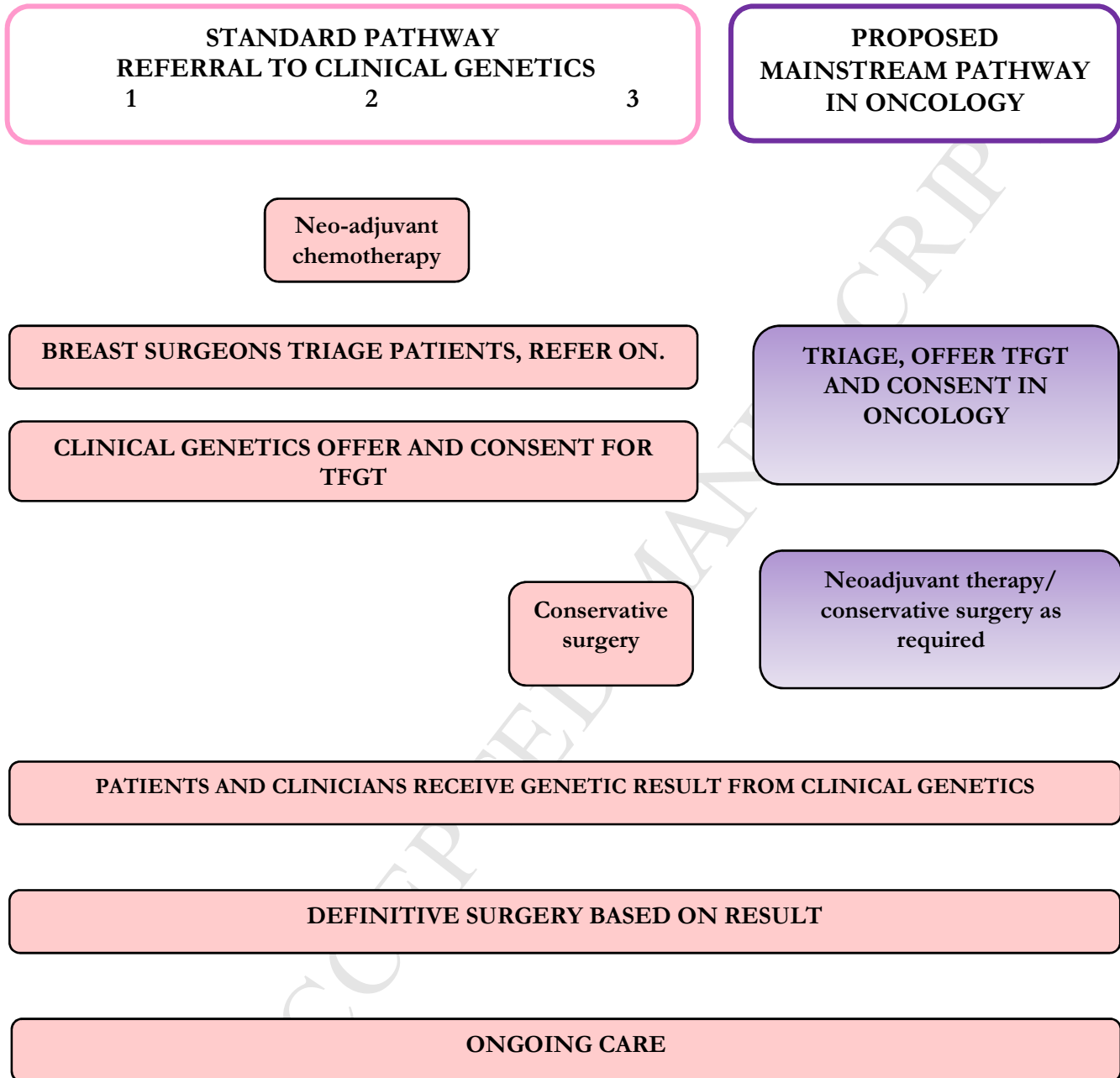
We would like to sincerely thank all the practitioners who participated in these interviews, and for allowing us to observe their daily practice at the clinic. We would also like to thank Julia Lawton for feedback on an earlier draft of this manuscript. We would also like to acknowledge Breast Cancer Now who funded this project, Grant no: [2016MayPR700].

Compliance with Ethical Standards

Conflict of Interest SW, MP, DS, JL, OY, and NH declare that they have no conflict of interest.

CG has sat on advisory boards for AstraZeneca, Clovis and Tesaro, has received lecture fees from AstraZeneca and Tesaro and received research funding for clinical trials from AstraZeneca and Tesaro.

Human Studies and Informed Consent All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 (5). Informed consent was obtained from all patients for being included in the study.

Figure 1: Current and proposed breast cancer pathways

HIGHLIGHTS

A micro-level examination of clinicians' work assembling an 'oncogenetic taskscape'.

Mainstreaming genomic testing requires changes to professional jurisdictions.

Technology's clinical relevance informs clinicians' acceptance of mainstreaming.

Clinical implementation of new technology requires inter-professional collaboration.