PRODUCTIVITY

Development of a skill mix and study planning tool for research teams

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Abstract

There are various tools available in acute and primary care settings to support decision making about safe-staffing levels. Calculating safe staffing levels is about more than just the number of people on duty. It must reflect skill mix and tasks, and this is more complex outside traditional nursing roles. It is essential that research nurses, who work in multidisciplinary teams collecting the evidence that underpins safe and effective healthcare, are equipped to practise safely, but staffing level tools do not take their unique roles into account. This article describes University Hospitals Bristol Research Work Plan Tool (BRIS-TOOL), developed to enable research managers to identify skill mix in their teams and support effective study planning. It also discusses how the tool accurately reflects research teams' productivity. Finally, the article suggests that the tool can be used to profile research posts, illustrate the breadth of work undertaken in these posts, inform study design and help clinical colleagues to understand research roles better.

Keywords

nursing management, research, skill mix, workforce planning tool

SAFE STAFFING is a focus for all NHS trusts, although the resources used to calculate staffing levels, such as Safe Staffing for Nursing in Adult Inpatient Wards in Acute Hospitals (National Institute for Health and Care Excellence (NICE) 2014), mainly focus on ward settings. In this resource, chief nursing officer for England Jane Cummings states: 'Each ward needs the right team of staff to provide high-quality care for their patients and their individual needs. This doesn't happen by accident – it requires an evidence-based approach, clinical judgment and regular monitoring.'

The body of evidence and number of tools is increasing and developing, to reflect different work environments and patient needs, and in some countries there has been a move towards mandating staffing levels, which can benefit the nursing workforce and patient care (Royal College of Nursing (RCN) 2012).

Safe staffing levels should consider more than the number of people on duty and should reflect skill mix and the tasks that need to be carried out (National Quality Board 2016). Doing so is more complex in areas of practice outside traditional ward environments. For example, determining safe staffing levels for clinical nurse specialists (CNSs), who have additional responsibilities and deliver advanced patient care in a range of specialties, is impossible with most of the tools available. To address this, NHS Scotland has adapted its nursing and midwifery workload and workforce planning tools to use with this staff group (NHS Scotland 2014) and combines a tool that measures levels of care and complexity of interventions with a workload index that demonstrates productivity.

Like the CNS workforce, research nurses cannot use existing workforce tools. They function in multidisciplinary teams where doctors, nurses, midwives, allied health professionals and research support professionals work together to build the evidence that underpins safe and effective healthcare. Therefore, it is essential that they are equipped to practise safely.

Most of the tools that support staff planning quantify the volume of nursing care that needs to be provided, and are developed and used primarily in environments where care is delivered in established boundaries (RCN 2010). Clinical research teams work in ever-changing clinical environments to deliver a range of research studies, each requiring a varied clinical skill set, to different groups of patients. Determining research teams' skill mix is the essence of having 'the right staff, with the right skills, in the right place at the right time' (National Quality Board 2016), and is a complex process that requires specialised tools.

Need for a tool

Historically, research staff in NHS trusts were mostly in band 6 or 7 and worked in isolation, or in small teams, some with administrative support, but many without. The National Institute for Health Research (NIHR), established in 2006, aims to ensure that all the research staff it funds work in supportive

environments and as part of a team. This is important, as the number of patients who participate in clinical research studies has tripled in the past six years to reach more than 630,000 people by 2014 (NIHR 2016).

Research is increasingly part of clinical care, and the spectrum of work that research teams complete is broad, ranging from the use of straightforward questionnaires to the undertaking of complex multi-therapy trials, all of which require patients' participation. Many research staff deliver new treatments and therapies, so are often the first to observe the effects (Hastings et al 2012).

This evolving workforce needs to work efficiently and effectively to enable research studies to be delivered safely, on time and to target. Therefore, being able to make decisions about the workforce, its capacity and skill mix, is critical (Ocker and Pawlik Plank 2000), but also challenging. There is a lack of safe-staffing resources relevant to the research workforce, although the Study Intensity tool (Gough et al 2011) enables staff to calculate the whole-time equivalent time required to deliver a research study by inputting relevant details onto a spreadsheet. The results then support decisions about any team's capacity to undertake a study.

Study planning and skill mix

Research teams undertake a vast range of duties, from developing study proposals, applying for funding, submitting proposals for approvals, and recruiting patients, to delivering research, caring for patient participants, collecting data, writing reports, ensuring safety and archiving documents. Each study requires clinical and study management skills, as well as research knowledge. Staff develop this knowledge to enable faster set up and efficient delivery of future studies. As research teams support an increasing range of studies, it is essential that they have the appropriate skill mix to manage their workload and to determine which studies they have the capacity to accept.

The lack of appropriate tools to support them in this regard has led to the development of the University Hospitals Bristol Research Work Plan Tool (BRIS-TOOL).

BRIS-TOOL

Development

The BRIS-TOOL was developed using elements of the CNS work plan tool, which had been introduced to the trust as part of a CNS review. The tool is a spreadsheet requiring completion at regular intervals to indicate the activities that CNSs undertake; this then gives an accurate description of the work. To ensure the activities correctly reflected research nurses' work, the spreadsheet was adapted to include categories identified by research nurses when they were asked to evaluate their work (Hyatt and Munro 2013). It was further modified to include a record of the research study, alongside the activity undertaken (Figure 1).

The tool was first used by the trust's research teams, for four weeks in November 2013, to define the range of research activities they were involved in and to illustrate how these were distributed among the teams. It was completed by healthcare professionals, including research nurses, midwives, allied health professionals and members of the team with an administrative role, including research administrators, data managers and trial coordinators.

Analysis of results showed which staff groups were undertaking each type of activity and how much time the teams were spending on each research study. The tool also identified the ratio of patient-facing (clinical) and non-patient-facing (administrative) activity for each type of post, which varied according to team structure.

This evidence supported the inclusion of research administrators in a team of research nurses, which freed up the nurses to undertake more research patient care. It also illustrated each staff group's time commitment to specific studies, which enabled better decision making about taking on new studies when older ones ended.

Refinement

Subsequent use of the tool led to an expansion of the activities list to illustrate the spectrum of research workload in more detail and it can now be used by teams who coordinate multicentre studies and those working in adult and child care settings. The analysis has been broadened to allow breakdown by post and study, thereby providing greater evidence to underpin skill mix and study review.

Using the tool

Team members complete the tool spreadsheet using dropdown options for most cells, which aids overall analysis.

Each day is divided into half-hour slots, and staff select the code for the study they have been working on and the code that most appropriately describes the activity they have been undertaking. There is a 'comments' line for additional information. Activities that take less than half an hour, but are repeated frequently, can be grouped into half-hour blocks to ensure they are captured as part of the working week. It is not important what time they are identified in the tool. For example, the trust requires me to walk between locations, each journey takes ten minutes and I do this six times a day, so I complete two half-hour periods as 'travel within trust'.

Completing the 'study code' column enables identification of the type of work undertaken by staff group, band, team and post (Figures 2 and 3), and study support by staff group, band, team, post and work activity (Figures 4, 5 and 6). This enables a comprehensive review of the workload, research portfolio and skill mix.

Figure 1. Example of the University Hospitals Bristol Research Work Plan Tool (BRIS-TOOL)

Name				Job Title			WTE		Hours		Research Work Plan Tool			
Division				Team			Band		Role					
	Date		Date		Date		Date		Date		Date		Date	
	Monday		Tuseday		Wednesday		Thursday		Friday		Saturday		Sunday	
	Study Code	Description of work -SEE KEY	Study Code	Description of work -SEE KEY	Study Code	Description of work -SEE KEY	Study Code	Description of work -SEE KEY	Study Code	Description of work -SEE KEY	Study Code	Description of work -SEE KEY	Study Code	Description of work -SEE KEY
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Key: WTE = whole time equivalent

Figure 2. Proportional clinical and non-clinical activity for band 6 research nurses with no administrative support

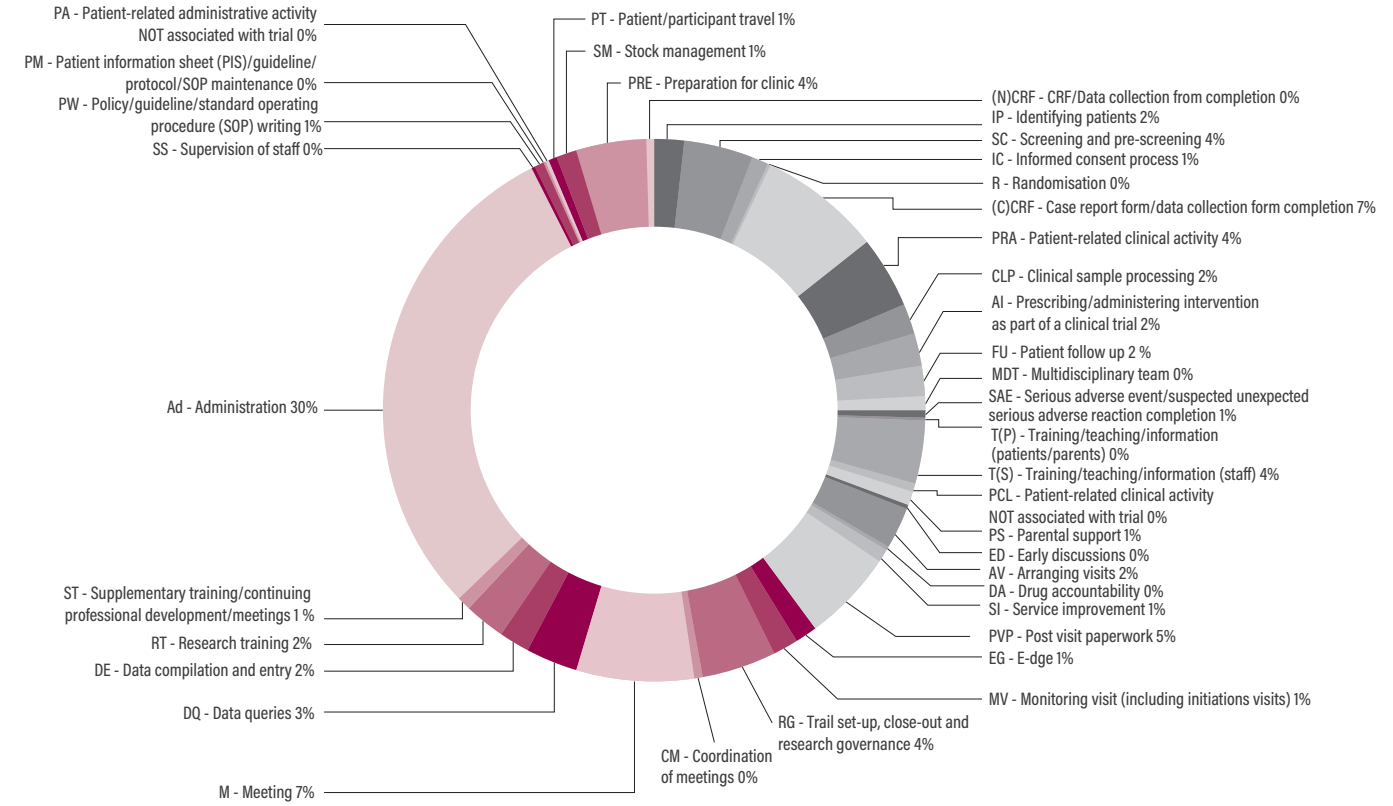


Figure 3. Proportional clinical and non-clinical activity for band 6 research nurses with administrative support

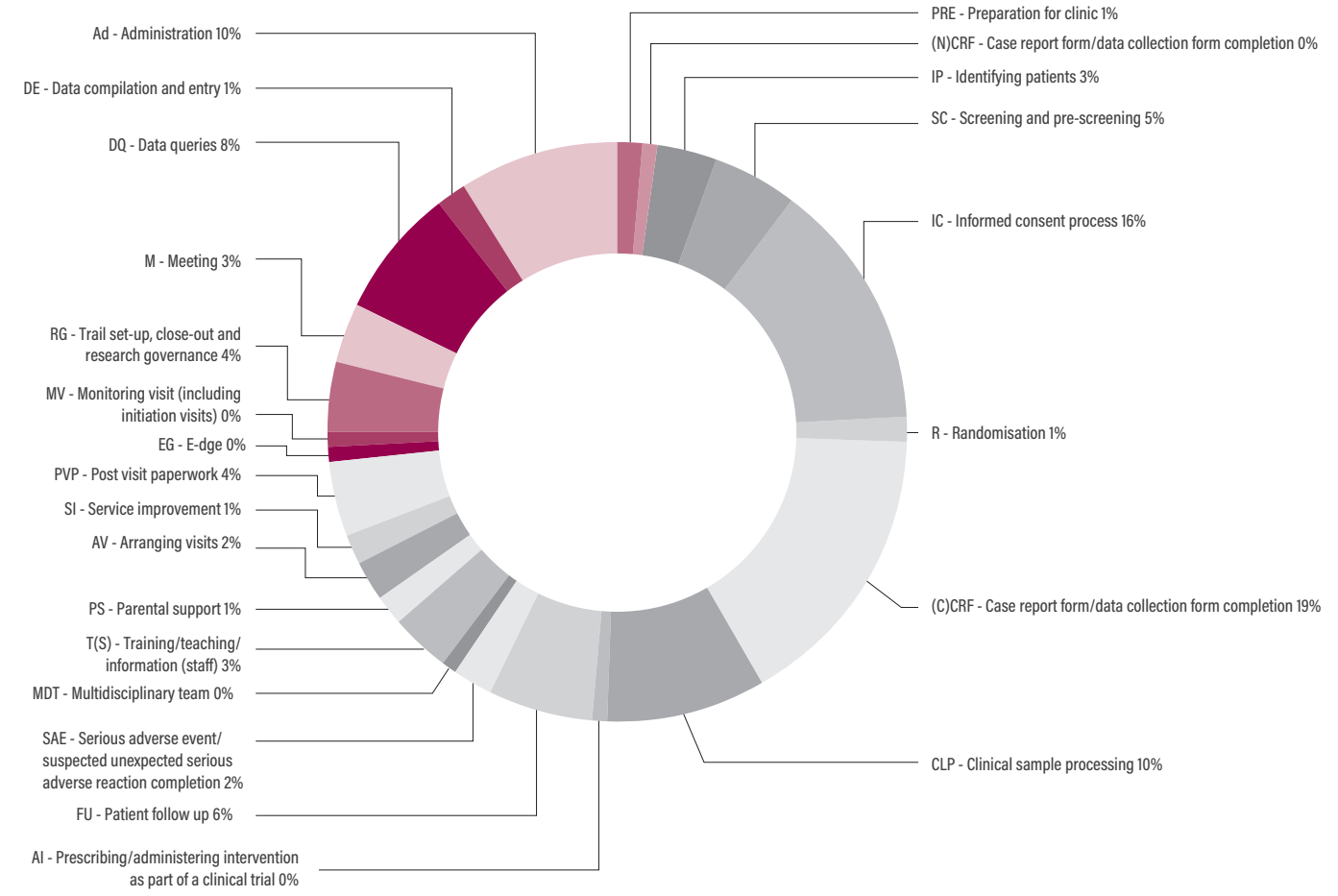


Figure 4. Activities undertaken by research nurses by band of study (similar charts can be produced for individual research studies)

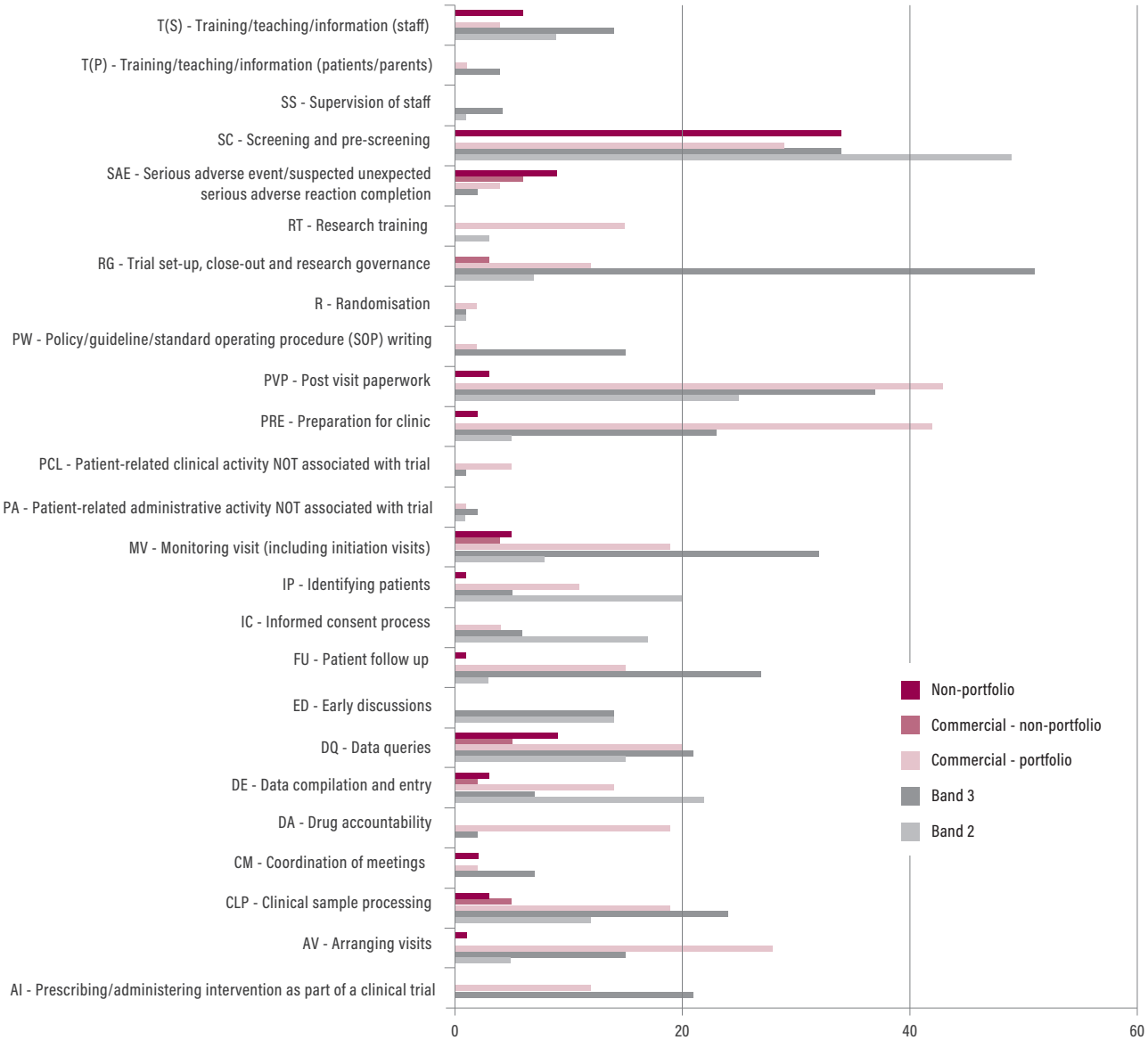
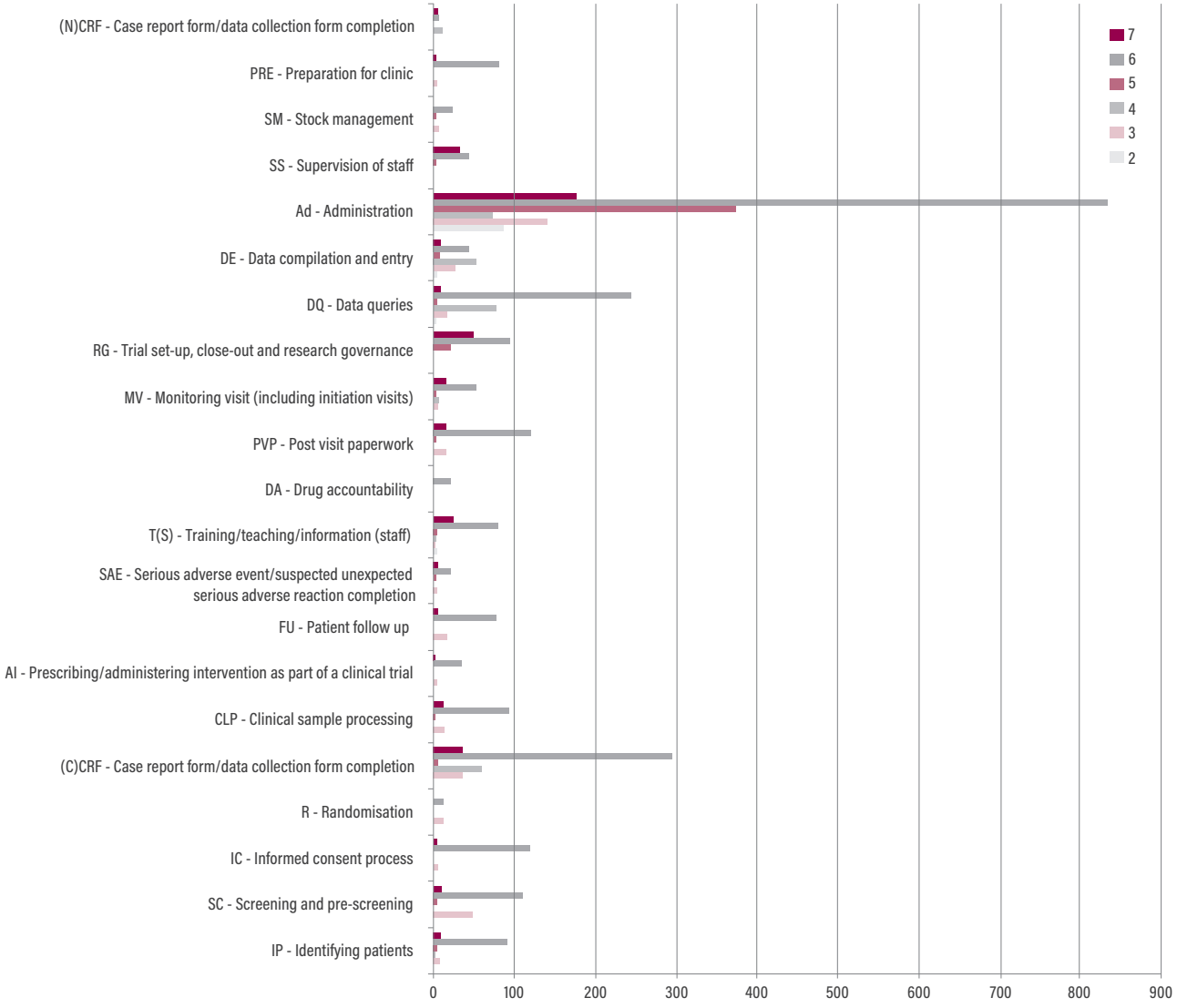


Figure 5. Activities undertaken by each band of research staff – sample of total activities shown (similar charts can be produced for individual research studies)



Codes

Work activities

These appear as codes in the dropdown menu, and each spreadsheet has a tab with the full list and examples to support selection, as illustrated in Table 1. It is crucial to describe these with examples, and to discuss potential ambiguities to ensure consistency of choice by staff. Work is divided into clinical activities, non-clinical activities, other activities, absence, and coordinating site activities.

Research studies

Each team has their own dropdown menu based on their current studies. Listing the studies alphabetically enables staff to select them easily, and they should be grouped in a way that is most intuitive for the team to use.

Analysis

The data can be presented as pie and bar charts, with items colour coded so they can be interpreted easily and illustrate the work activities taken on by each staff group or the whole team. It is possible to look at this information across the entire portfolio of research being undertaken by a team, or for each individual study.

Scope

The tool can be used to determine the skill mix of research teams to ensure it is appropriate for the studies undertaken and has been used to do the following (Tacchi 2015):

- Define team structure.
- Inform skill mix.
- Inform decision making about taking on new studies.

Figure 6. Percentage of time spent on each study by the whole team

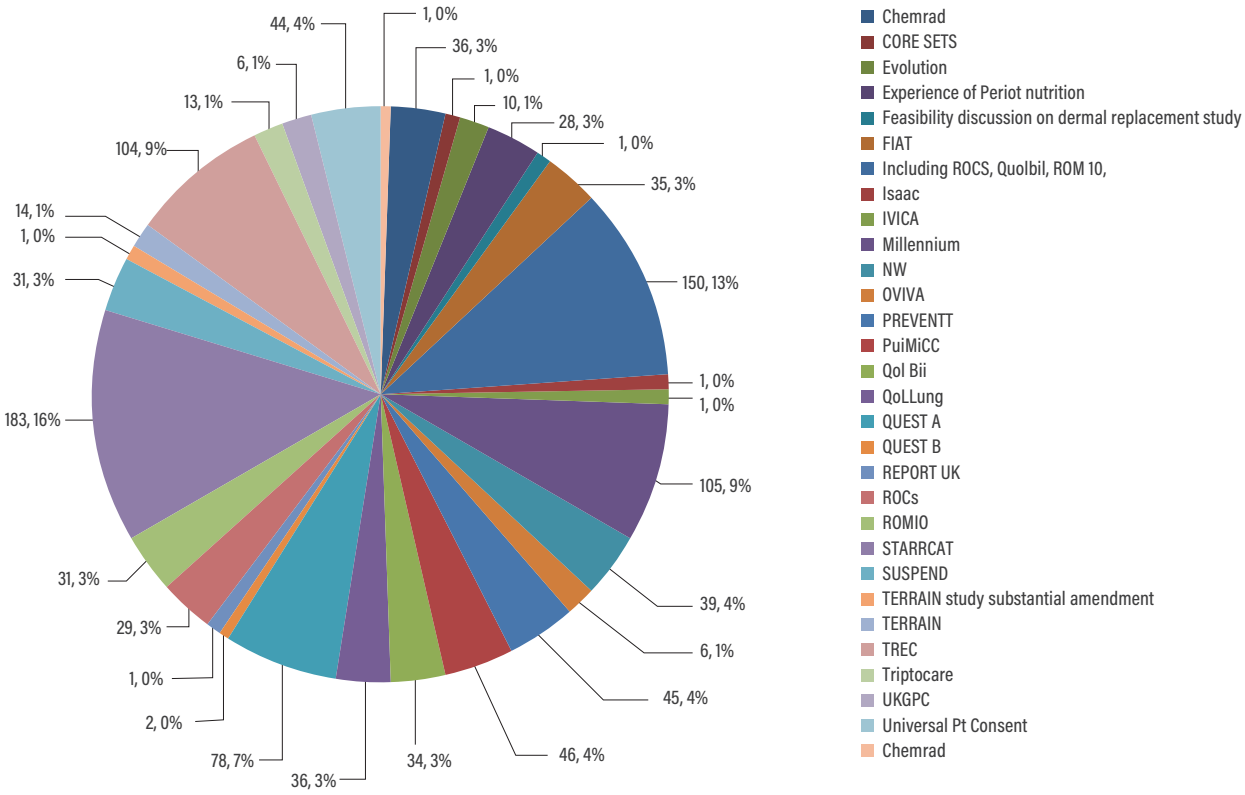


TABLE 1. Work activities

Code	Clinical activities	Examples
IP	Identifying patients	Visiting wards, clinics or community areas to identify cohorts of patients to screen for trials/studies. Mailshots, pre-screening databases/notes/clinic letters/lab reports
SC	Screening and pre-screening	Visiting wards, clinics, home visits or community areas, searching case notes, to identify patients suitable for inclusion in clinical trial/study. Liaising with consultants/principal investigators/clinical trial coordinating centres to determine if patients meet inclusion/exclusion criteria. Sending information to families to discuss study/eligibility
IC	Informed consent process	Discussing a clinical trial/study with patient/relative/legal representatives, assessing capacity to consent, signing consent forms
R	Randomisation	Collecting information and communicating with trial managers either over the telephone/internet to randomise patients to treatment arm, blinding patient to treatment arm, confirming inclusion/exclusion criteria
(C)CRF	Case report form/data collection form completion	Accurate collection of patient data/investigations either online or in hard copy to send to trial managers and file securely – either pre- or post-randomisation
PRA	Patient-related clinical activity	Performing or assisting with phlebotomy, ECG, requesting and chasing up investigations, administering non-trial medications, reviewing case notes, swabbing and vaccinating
CLP	Clinical sample processing	For example, centrifuging, storing, arranging transport internally or externally. Taking samples to labs. Couriers, ordering, sorting dry ice
AI	Prescribing/administering intervention as part of a clinical trial	For example, trial drugs, calculating doses, applying/attaching devices. Temperature checking – blinded/unblinded nurse requirements. Supporting ward staff. Supplying investigational medicinal product from pharmacy

FU	Patient follow up	Ward, clinic, community, home visit or telephone call to follow up a patient on a trial/study – either to review patient or to complete scheduled trial follow-up, posting questionnaires
SAE	Serious adverse event/suspected unexpected serious adverse reaction completion	Investigating adverse events and completing adverse events forms to send to trial managers/ trust risk managers – time sensitive
MDT	Multidisciplinary team (MDT)	Attending MDT meetings about trial participants and possible participants, for example imaging meetings, discharge planning meetings, meeting nominated patient representative for mental capacity. Liaising with teams for every study visit, for example pharmacy/labs, ensuring doctor available
T(P)	Training/teaching/information (patients/ parents)	Providing information/training to patients/parents on the medical device/investigational product/trial process either directly or indirectly, patient diaries, patient and public involvement and engagement event (PPIE)
T(S)	Training/teaching/information (staff)	Providing information/training to clinical/medical staff on the medical device/investigational product/trial process either directly or indirectly, patient diaries, PPIE event
PCL	Patient-related clinical activity NOT associated with trial	For example, pre-and post-trial visit follow-on care, bleep holder, administering medication, swallow screening, discharge planning, arranging admission and nasogastric tube insertion
PS	Parental support	Supporting parents and families
ED	Early discussions	Early discussions about future studies
AV	Arranging visits	Finding space to conduct visits/liaising with various departments to get space. Contacting clinical team to ensure there is medical cover at visits
DA	Drug accountability	For when drugs do not go through pharmacy
SI	Service improvement	Experimental Cancer Medicine Centre required activity
PVP	Post visit paperwork	Following up on blood results post visits. Writing those in notes and getting them signed off by principal investigator (PI). Faxing visit paperwork to supporting organisations
	Non-clinical activities	
EG	E-dge (Local Clinical Research Management System)	Update and input into E-dge
MV	Monitoring visit (including initiation visits)	Visit by trial managers/regulatory body to ensure compliance with good clinical practice (GCP) and trial protocol, protocol training by trial managers to PI and trial staff
RG	Trial set-up, close-out and research governance	Completing trial set-up formalities and administration, liaising with PIs, chief investigators, trial sponsors and networks, completing feasibility/financial analyses, risk analysis, submitting application to research and development, identifying new trials and studies, liaising with research networks, sending CVs and GCPs. Liaising with hospital departments for pro-formas. Planning how to implement trial/logistics
CM	Coordination of meetings	SeFt up and organisation of site initiation visits/monitoring
M	Meeting	Trial-related formal and informal meetings with research staff/managers/PIs for reports/ discuss trial feasibility
DQ	Data queries	Reviewing information sent to trial managers to ensure accuracy/completeness. Liaising with clinical staff about data queries/data clarification
DE	Data compilation and entry	Entering data into in-house screening logs/other spreadsheets and E-dge, producing reports of research activity and accrual. Data entry onto study-based system
RT	Research training	For example, GCP training, protocol training, clinical research nurse/clinical trial practitioner competencies, investigator meetings
ST	Supplementary training/continuing professional development/meetings	For example, trust training, maintaining personal development portfolio, conferences, visits to other sites and research network headquarters, trust departmental meetings not specifically for research

Ad	Administration	Emails, filing, archiving, printing, photocopying, post etc not covered above, invoicing, requesting case notes, ordering and maintaining equipment. Liaising with PIs/sub-PIs for signatures
SS	Supervision of staff	Other research staff or clinical staff, appraisals, signing off competencies, inductions, training in trial protocols/ethics etc. Nursing students, supporting research link nurses
121	One to one meetings	Personal meetings between (line) manager(s) and staff member for work-related discussions
PW	Policy/guideline/standard operating procedure(SOP) writing	In accordance with local procedures
PM	Patient information sheet (PIS)/guideline/ protocol/SOP maintenance	Ensuring protocol, guidelines, PIS are up to date
WM	Portal administration and maintenance	IT web maintenance for shared care centres
RD	Research design/literature review	Writing protocols, preparing reports
PA	Patient-related administrative activity NOT associated with trial	
PT	Patient/participant travel	Arranging patient/participant/families travel, texting/phoning to remind people to attend appointments
SM	Stock management	
PRE	Preparation for clinic	
(N)CRF	Case report form/data collection form completion	Accurate collection of patient data/investigations, either online or in hard copy, to send to trial managers and file securely either pre- or post-randomisation
FM	Financial management	Invoicing, budget management and meetings with finance team
	Other activities	
T	Travel	Within shift between tasks, for example from office to other sites/hospitals, home visits
TT	Travel within trust	Within shift between tasks, for example from office to other areas of trust
WT	Waiting time	Before meetings/waiting for patient
B	Break	Lunch
TF	Technology faults	With software/hardware, and where work has been significantly affected
CLS	Clinical work outside of research role	For example, activities to support clinical team not directly related to research and link nurse meetings
	Absence	
AL	Annual leave	Planned annual leave
OL	Other leave	For example, carers' leave, bereavement leave, maternity leave
S	Sickness	Long or short term
SL	Study leave	To work on external project, for example university course
NW	Not at work	Not expected to be at work, for example day off and time slot outside of contractual working hours
OC	Off duty/on call rota	
	Coordinating site activities	
CSA	Coordinating site administration	Administrative tasks associated with being the coordinating site for a multi-centre study
CST	Coordinating site training	Delivering the training, local or off site, associated with being the coordinating site for a multi-centre study

CSMV	Monitoring (visit or remote)	Monitoring activity, local or off site, associated with being the coordinating site for a multi-centre study
CSQ	Responding to queries	Responding to queries raised, associated with being the coordinating site for a multi-centre study
CSR	Reviewing data	Reviewing data associated with being the coordinating site for a multi-centre study
CSM	Meetings	Meetings associated with being the coordinating site for a multi-centre study
CSPA	Portal administration	Portal administration associated with being the coordinating site for a multi-centre study

» Provide evidence of team support for studies to principal investigators.
» Identify potential resources when studies close.

The BRIS-TOOL helps illustrate the breadth of work undertaken by members of the research team, which is an effective way of demonstrating and quantifying the 'hidden' activities that exist alongside recruitment, the standard measure of a team's productivity. It can also be used to build post profiles; combining the results from post holders with the same titles and bands shows what their workload should look like. This information can be used to map staff's activity, enabling them to identify areas for a change in focus. This is most useful for senior posts, which combine team and study management with research delivery.

When research teams are managed in clinical environments where senior managers have no research experience, the BRIS-TOOL supports their understanding of roles, illustrates the combination of activities required by the team and identifies the contribution research staff make to patient care. Finally, detailing the activities in each study and the actual time taken to deliver those activities, helps evaluate the accuracy of the estimates made in the study design, which can be used in future study designs to ensure they are realistic. The case studies in Box 1 illustrate practical use of the BRIS-TOOL.

BOX 1. Case studies

Using the BRIS-TOOL to determine the skill mix of a research-service restructure
Following reorganisation of the clinical research networks in 2014, five research teams in University Hospitals Bristol NHS Foundation Trust were combined into one unit. This required the restructuring of the teams, who had to deliver more than 180 studies. Therefore, it was crucial to determine the appropriate skill mix and ensure the studies were delivered effectively.
Research staff used the BRIS-TOOL over a four-week period to identify the tasks they undertook for each of their studies. The data were then analysed to provide information about which band of staff was undertaking what activity for each type of study. This gave a thorough understanding of the type of activity each post and band of staff should undertake and it was then possible to determine the number and type of posts required for the new team. With such a large number and range of studies delivered by the teams, it was reasonable to expect that the new unit's skill mix determined by this analysis indicated their long-term needs. As a result, the whole time equivalent for each post and band was calculated and new band 8a and band 5 research nurse posts were created. This also secured funding as the skill mix was evidence based.

Using the BRIS-TOOL to identify the time taken by a research team to deliver each study
A research team working with a number of principal investigators in a broad clinical specialty was trying to deliver 20 studies. The team had a feel for how their time was spent, and that it was not equitable. Staff used the BRIS-TOOL for four weeks, and analysis of the data illustrated how their time was spent across their studies, and highlighted that four studies accounted for 47% of their time. This enabled them to quantify how much time would be released when one of these studies closed, and to make informed decisions about which studies could then be delivered.

Helping non-research staff understand the complexities of research work
The pie charts produced by the BRIS-TOOL illustrate the range of activities undertaken by research nurses, as shown in Figures 2 and 3. These have been used to describe and discuss research nurses' roles with clinical and other trust colleagues, to help them understand the complexity of research work and show that research nurses are clinical. They highlight the standard measure of research activity and how recruitment is not a true indicator of productivity. These charts show how much time is spent recruiting patients, which includes identifying, pre-screening and screening them, obtaining their informed consent, and randomisation, and how this is a fraction of the total workload.

Conclusion

Tools to establish staffing have been developed for hospital environments and adapted for use in primary care. Research teams work in both these environments, delivering care to patients involved in research studies. The BRIS-TOOL enables them to determine skill mix and post profiles, creating effective teams and ensuring efficient use of research funding. It can be used to inform decisions about capacity to take on new studies and support staffing decisions when designing new research studies. Finally, the BRIS-TOOL can enable better understanding of research roles by colleagues of different disciplines, or who do not have a research background.

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