Provision of On-Call Urology Services in the UK: Its impact on lifestyle and well-being, and its relationship to stress.

Stephen R Payne[1,2,3]

Nyssa Purchase[3]

Agata Wezyk[3]

Maddy Greville-Harris[3,4]

Kevin Thomas[3]

Kevin J Turner[3,5]

1. Workforce, British Association of Urological Surgeons
2. Manchester University NHS Foundation Trust
3. Department of Psychology, Bournemouth University
4. Department of Psychology, University of Exeter
5. University Hospitals Dorset NHS Foundation Trust

Corresponding author:

Stephen R Payne

stevepayne.urol@btinternet.com

https://orcid.org/ 0000-0001-5359-1877

Workforce Lead

British Association of Urological Surgeons

35-43 Lincolns' Inn Fields

London WC2A 2PE. UK.

0207 869 6950

Abstract:

Introduction:

On-call work is an integral part of urological practice in the UK, yet its effects on urologists' lifestyles, wellbeing, and stress remain underexplored. Identifying factors that contribute to this stress may help prolong careers and improve professional quality of life.

Materials and Methods:

An anonymised online survey of BAUS members assessed the impact of out-of-hours duties on lifestyle, wellbeing, and stress. Variables included age, gender, hospital type, clinical experience, rota design, and call frequency between midnight and 8 a.m. Lifestyle and wellbeing were measured using linear evaluation scales, while stress was assessed with a validated perceived stress scoring system.

Results:

Complete responses were obtained from 132 mid-grade urologists and 289 consultants engaged in on-call rotas. Overall, out-of-hours work moderately impaired quality of life. Lifestyle disruption increased with consultant age, whereas younger and less experienced colleagues reported higher stress, particularly related to childcare responsibilities and sleep deprivation.

Conclusion:

Although the impact of on-call work on UK urologists appears less severe than for other medical specialties, significant challenges persist. Ageing, childcare demands, and sleep deprivation remain key stressors associated with out-of-hours activity, underscoring the need for strategies to support wellbeing across career stages.

192 words

Keywords:

UK Urology, On-call, Lifestyle, Wellbeing, Stress, Work/life balance, Global intrusion, Informal carer responsibility, Sleep deprivation, Inadequate recovery periods

Introduction

Previous studies have shown virtually all UK urologists, whether in training or fully qualified, have on-call responsibility (1). While research about on-call work on doctors' work–life balance and wellbeing has been examined (3), the impact has largely focused on general practitioners (4–8) and hospital doctors working rigid shift patterns (9). Limited data about the effect of on-call working exist for hospital specialists, but evidence from the United States suggests that surgeons working >80 hours/week, or more than two nights on call per week, experience significantly higher rates of career dissatisfaction, depression, and burnout; factors that frequently lead to conflict between professional and personal life (10).

Both lifestyle disruption and stress undermine wellbeing and diminish the capacity to deliver high-quality patient care (11–13). Stress in the medical workplace arises from multiple factors (13,14) (Table 1) and is a key precursor to burnout, which threatens career progression, increases clinical risk, and promotes premature withdrawal from the workforce (2,26,27). Burnout is already recognized as an issue for urologists worldwide (28,29).

Stressor	**Reasons for stress**
Perfectionism & Performance Pressure[15,16]	High internal standards Fear of failure
Long Hours and Physical Demands[16,17,18]	Fatigue Sleep deprivation Physical exertion Excessive cognitive load
Team Dynamics and Communication[19,20,21]	Miscommunication Hierarchical organisational structures Trust issues in teams
Patient Mortality & Medical Errors[17,22,23]	Emotional burden from complications, deaths, or mistakes

Fear of Litigation[24,25]	Unrealistic patient expectation Spectre of legal risk Anxiety generating defensive practice

Table 1. Predominant causes of stress in health and social care, but especially relevant to surgical occupations.

There is, therefore, a clear need to understand the lifestyle disruption experienced by UK urologists working out-of-hours, and how this affects their wellbeing and stress. First, this self-report study aimed to generate descriptive data about the impact of on-call working on urologists' lives, concentrating on the lifestyle-related measures, work–life balance, informal carer responsibilities, life management, and personal relationships. It further explored the impact out-of-hours duties have on wellbeing, including sleep, stamina, workplace efficiency, and mental health. Second, cross-tabulation analyses, with chi square, were performed to examine the significance of relationships between stress levels and the type of on-call working, dependent upon gender, age, hospital type, and years of experience. Ultimately, the aim was to identify modifiable factors that could reduce harmful stress and lower the risk of career burnout.

300 words

Abbreviations

Bournemouth University	BU
British Association of Urological Surgeons	BAUS
Certificate of Completion of Training	CCT
Chi Squared	X^2
District general hospital	DGH
Locally Employed Doctor	LED
Number	n
Probability	p
Perceived stress score	PSS
Population stability index	PSI
Standard deviation	SD
Specialist hospital	SH
Specialist or Associate Specialist	SAS
Supporting professional activity	SPA
Specialty trainee (Year of training)	ST (1-7)
Specialist/Trust Urologist	STU
Teaching hospital	TH
United Kingdom	UK
Visual Analogue Scale	VAS
Work/Life balance	WLB

Materials and methods

An online survey to determine the lifestyle, wellbeing and stress impacts of on-call working for UK urologists was generated by the British Association of Urological Surgeons (BAUS) and the Department of Psychology at Bournemouth University (BU).

Study population

All BAUS members, irrespective of status, as well as individual urologists informed about the study via WhatsApp rota groups, were invited to participate. The employment grades surveyed were consultants, Trust appointed specialists either as a Specialist or Associate Specialist (SAS) urologists or as a Locally Employed Doctor (LED), and specialist urological trainees (STs).

Study structure

The survey structure, and content, was approved by the BU research ethics panel (52313); participation was entirely voluntary, withdrawal at any stage was supported and data was collected, and archived, on a secure SurveyMonkey® platform. Participants were asked to consent to anonymised data collection and provide baseline demographic data about their gender (male, female, non-binary, preferred not to answer), age (in quinquennial groups between 25-30 years to >64 years), employment grade (as specified above), the institution in which they worked (District General Hospital (DGH), Teaching Hospital (TH) or Specialist Hospital (SH)) and the frequency with which they were disturbed between midnight and 8am (every night, every 2-3 nights, every 4-5 nights, occasionally).

Individual's perceptions of the global effect of on-call working on lifestyle, and wellbeing, were evaluated using a 10-point Visual Analogue Scale (VAS) between 1 – "No disruption" and 10 – "Major disruption" with "Occasional disruption" as the equipoise. Factors influencing lifestyle; work/life balance (WLB); informal care responsibility; managing life outside medicine and relationship issues, and wellbeing; sleep quality; stamina; efficiency at work and mental health were all collected on a 5-point Likert scale between 1 – "It's not an issue for me" and 5 – "It's a major issue for me" with 3 – "Occasional disruption" as the equipoise. Individual perceived levels of

stress were evaluated utilising a validated self-report 10-item Perceived Stress Scale (PSS-10), assessing feelings and thoughts experienced during the preceding month (30). Responses were rated on a Likert scale between 0 - “never” and 4 - “very often” with 4 questions (items 4,5,7 and 8) reverse scored (4 – “very often” and 0 – “never”) if positively worded (Supplemental file 1).

Data collection

Invitations to participate in the online survey were emailed to the BAUS membership in November 2023. This invitation was repeated after six weeks, three and six months and circulated by on-call WhatsApp® groups during this period. Data were collected up to the end of June 2024 and downloaded from SurveyMonkey® as a flat file for analysis in Microsoft™ Excel.

Data analysis

The total number of entrants onto the platform was noted. Those who did not give consent, failed to provide demographic data, or gave <90% complete data, were excluded from subsequent analyses (31). Lifestyle and wellbeing data were separated out dependent on whether individuals were on a mid-grade or consultant on-call rota; all participants were included in a homogenous cohort for analysis of stress data.

Lifestyle and wellbeing Likert scores were correlated against individual participant’s age, gender, hospital type and frequency of being called between midnight and 8am. Ambient stress for all taking part in on-call activity, was evaluated using the individual summated PSS scores and were categorized as having low (PSS score 0-13), medium (PSS score 14-26) or high (PSS score 0-40) levels of stress (30). Stress categorization was compared against gender, age, hospital type, type of rota (mid-grade or consultant), and experience by training grade for those on mid-grade rotas (locally employed doctor (LED), ST3, ST4, ST5, ST6, ST7, Post CCT Fellow and SAS) as well as years in post for consultants. PSS levels were also compared with the frequency of on-call (1 night in 0-3, 1 night in 4-8, 1 night in 9-12, one night in 13-17, one night in 18+ rotas), childcare levels of disruption (it is not an issue for me, minor disruption,

occasional disruption, regular disruption and it is a major issue for me), and sleep intrusion (telephone call or needing to return to hospital). A series of cross-tabulations, with Chi square (X^2) tests, explored the relationship between these demographic/work-related variables and participants' ambient stress scores.

Results

707 respondents entered the Survey Monkey site; exclusions from further analysis are shown in Table 2.

Respondent breakdown	Number
No consent	2
Gender demographic not completed	35
Occupational status not completed	124
<90% data complete	122

Table 2. Criteria for exclusion from analysis.

424 respondents, 292 urologists (289 consultants and 3 SAS urologists) on consultant on-call rotas, and 132 on mid-grade rotas (22 SASs, 88 STs and 22 LEDs) had >90% completeness in data entry and were included in analyses. The analysed cohort comprised 306 participants who identified as male (72.2%), 117 as female (27.6%); no non-binary status was declared in this group and 1 participant preferred not to answer. The gender and age profiles, and employment grade of respondents is shown in Supplemental file 2. 44.6% of participants worked in DGHs, 47.2% in THs and 8.2% in SHs.

Lifestyle

There was no difference in median level of intrusion between men and women on consultant rotas. Lifestyle impact, in the narrow age range of the mid-grade cohort, was unchanged but there was a steady increase in the median perceived level of disruption attributable to on-call in the consultant group as they aged (Table 3).

	31-34	35-39	40-44	45-49	50-54	55-59	60-64	>64
median	3	5	6	6	6	7	7	7.5
min	1	1	1	1	1	1	5	5
max	5	10	10	10	10	10	10	10
SD	2.83	2.78	1.93	2.23	2.55	2.70	1.60	2.25
n	2	36	62	68	73	31	7	6

Table 3. Global disruption to lifestyle: Consultant rotas; VAS scores for levels of disruption dependent upon age quinquennial.

The median VAS global lifestyle impact score for those on mid-grade rotas was 7 (more than occasional disruption) (Range 1-10, SD 2.24) and 6 for consultant rotas (slightly more than occasional disruption) (Range 1 – 10, SD 2.39). There was no difference in median level of intrusion between those working in DGHs by comparison to those employed in THs and SHs.

Work/Life balance

Overall, 55.4% of women and 48.9% of men had regular or major disruption to their WLB (Table 4).

Gender	n	Likert grade				
		Not an issue	Minor problem	Occasional disruption	Regular disruption	Major issue
Male	94	4.9%	14.2%	32.0%	33.3%	15.6%
Female	34	1.5%	15.4%	27.7%	40.0%	15.4%

Table 4. Work/life balance; Consultant rotas; percentage Likert scale distribution of the effect of on-call on work/life balance; all hospital types, dependent on gender.

>35% WLB disruption was seen in all consultant rota quinquennial age groups irrespective of hospital type. The level of intrusion increased and became more intense with age (Figure 1).

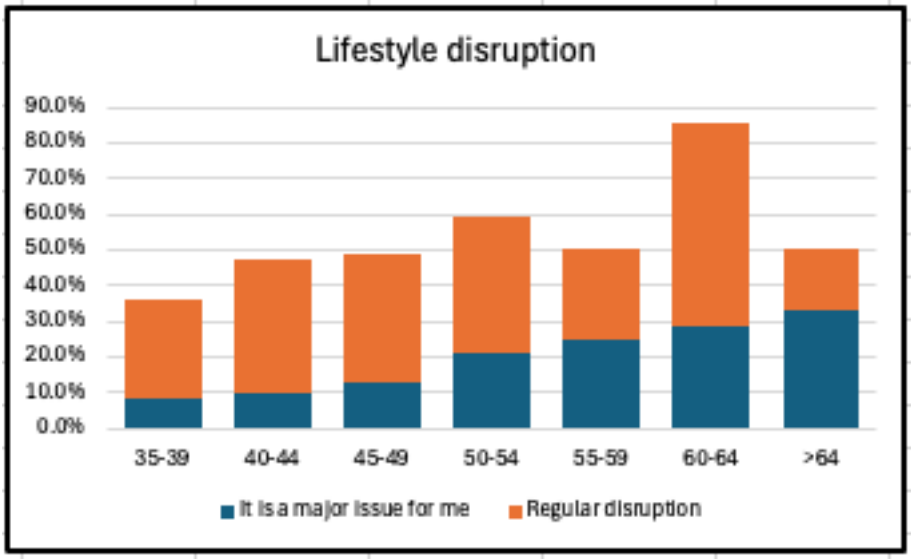

Figure 1. Work/life balance; Consultant rotas; regular or major lifestyle disruption by age; all hospital types.

27.3% of those on mid-grade rotas recorded regular disruption to WLB and for 18.2% it was a major issue; there was no gender bias difference in this cohort.

67.6% of women in DGHs noticed regular or major disruption to WLB, by comparison to 56.4% of men. Consultant rotas in DGHs demonstrated a greater intrusion of work into life by comparison to those on-call in THs and SHs (Table 5).

Hospital type	n	Likert grade				
		Not an issue	Minor problem	Occasional disruption	Regular disruption	Major issue
DGH	128	2.3%	13.3%	26.6%	35.2%	22.7%
TH & SH	141	5.7%	15.6%	36.2%	35.5%	7.1%

Table 5. Work/life balance; Consultant rotas; percentage Likert grade of effect of on-call dependent on hospital type.

This was especially the case for older urologists in DGHs than for colleagues in THs or SHs, although the numbers of participants >59 years was very small (Table 6).

Age	Regular disruption		Major disruption	
	DGH	TH and SH	DGH	TH and SH
35-39	0.0%	20.0%	0.0%	10.0%
40-44	37.5%	41.5%	6.3%	9.8%
45-49	31.8%	27.9%	9.1%	4.7%
50-54	48.1%	41.9%	25.9%	16.3%
55-59	34.4%	16.7%	25.0%	8.3%
60-64	30.0%	100.0%	35.0%	0.0%
>64	25.0%	100.0%	50.0%	0.0%

Table 6. Work/life balance; Consultant rotas; percentage Likert grade, regular or major disruption by age and hospital type.

The WLB disruption dependent upon the frequency of being called or having to return to hospital are shown in Table 7. The frequency of being disturbed for advice out-of-hours destabilised WLB in favour of work and having to return to hospital, even occasionally, had a marked effect on the level of intrusion from being on-call.

Type of disruption	Frequency of disruption			
	Every night	Every 2-3 nights	Every 4-5 nights	Occasionally
Called by phone	84.6%	64.4%	44.1%	34.7%
Return to hospital	100%	69.2%	61.6%	52.9%

Table 7. Work/life balance; Consultant rotas; percentage reporting regular or major disruption from calls between midnight and 8 am; all hospital types.

The median consultant on-call rota frequency, with substantial issues with WLB, where there was overnight disturbance, was 1 in 8 (Range 1-25, SD 3.82).

Providing informal care

Carer responsibilities were an issue for 51.6% of women on consultant rotas in DGHs, by comparison to 33.6% of their male colleagues. There was a much smaller gender differential for those working in THs and SHs (median 43.7%, Range 40.4% - 47.1%, SD 0.047).

>35% of consultants experienced regular or major disruption to their requirement to provide care because of their on-call commitments. The greatest intrusion was in the 35-39 age group; this effect peaked during the 40-44 quinquennial, although disruption was less intense at that point (Figure 2).

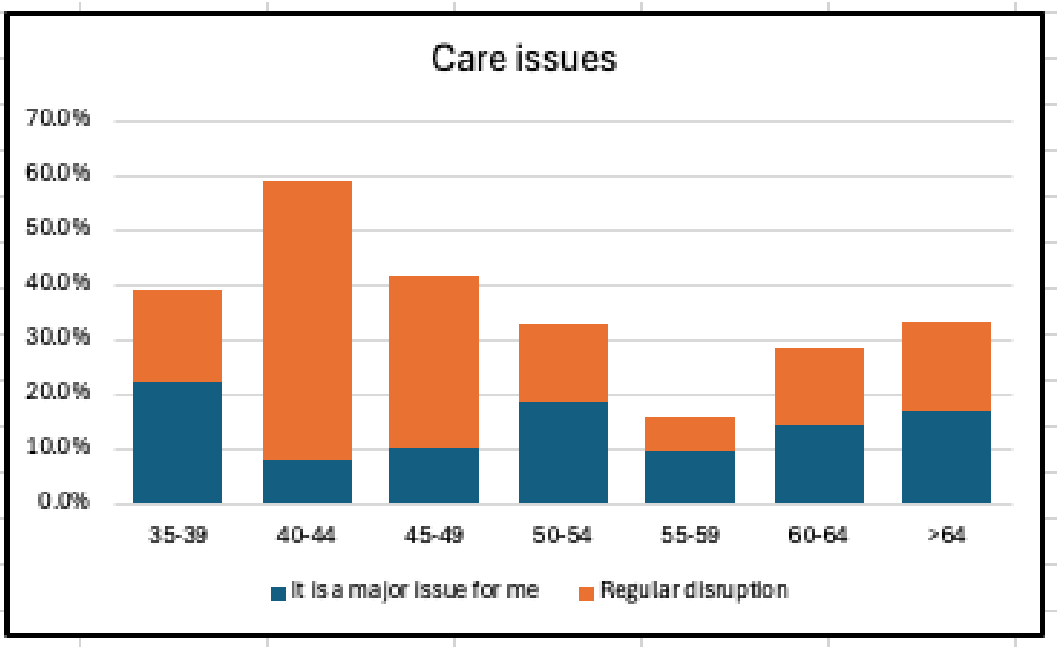

Figure 2. Informal care provision: Carer issues for consultants; regular or major disruption by age across all hospital types.

51.5% on mid-grade rotas had difficulties in making informal care arrangements for dependents; there was no gender difference in this cohort.

36.4% of the participants on mid-grade rotas reported regular or major disruption to informal care arrangements when phoned every night, and 8.3% every 2-3 nights; 9.1% and 28% had similar levels of disruption when having to return to hospital. Those on consultant rotas who were called most frequently overnight had the greatest disruption to their carer responsibilities but those required to occasionally return to hospital had a markedly greater disruption in care provision (Table 8).

Type of disruption	Frequency of disruption			
	Every night	Every 2-3 nights	Every 4-5 nights	Occasionally
Called by phone	53.8%	45.2%	37.7%	32.6%
Return to hospital	-	12.5%	42.9%	71.8%

Table 8. Informal care provision: Percentage of consultants reporting regular or major disruption from calls between midnight and 8 am; all hospital types.

The median on-call rota for consultants with substantial issues with informal care responsibilities, and who were disturbed overnight, was 1 in 8 (Range 2-25, SD 3.65).

Managing life

Males on-call in DGHs expressed major difficulties in managing life 21.3% of the time, by comparison to 14.7% of their female colleagues.

75.1% on consultant rotas had no unexpected problems in managing lives outside medicine, but 17.6% had regular, and 7.3% major difficulty. This group experienced increasing levels of disruption as they aged (Figure 3).

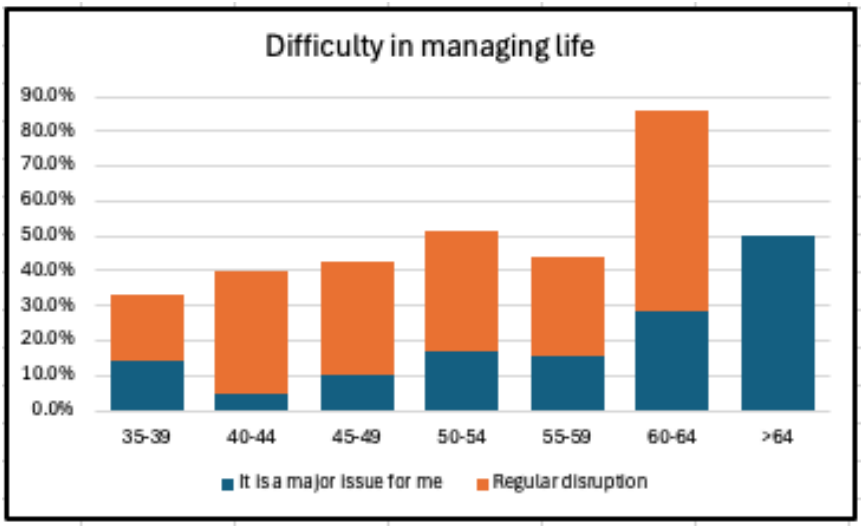

Figure 3. Managing life outside medicine: Regular or major disruption for consultants, by age, across all hospital types.

Regular disruption to the ability to manage life outside medicine, consequent upon being on call, was recorded by 39.4% on mid-grade rotas, and for 16.7% this was a major issue; there was no age, or gender differences in this cohort.

There was no gender difference in the number on consultant rotas expressing major issues with managing their life outside medicine in THs and SHs. However, 57.9% working in DGHs expressed substantial difficulty in managing life by comparison to 15.3% in THs and SHs.

Being called frequently to return to work out-of-hours had a substantially greater impact on both mid-grade and consultant rota participants. This was greater than for frequent telephone contact alone (Table 9).

Type of disruption	Frequency of disruption			
	Every night	Every 2-3 nights	Every 4-5 nights	Occasionally
Called by phone	69.2%	56.7%	37.7%	32.6%
Return to hospital	100%	61.5%	53.4%	38.1%

Table 9. Managing life outside medicine: Percentage of consultants reporting regular or major disruption to from calls between midnight and 8 am; all hospital types.

The median consultant on-call rota for those with substantial issues with managing life, and who were disturbed overnight, was 1 in 8 (Range 1-25, SD 3.69).

Relationships

Regular disruption to relationships, consequent upon being on call, was recorded by 37.1% on mid-grade rotas, and for 12.9% this was a major issue; there were no age or gender difference in this cohort. 81.5% on consultant rotas felt that on-call had no, little, or only occasional impacts on their relationships. The vast majority of consultants reporting regular or major relationship issues were <50 years of age and there was a higher level of relationship disruption amongst those in DGHs, particularly if they were male (Table 10).

Hospital type	Male		Female	
	Major issue	Regular issue	Major issue	Regular issue
DGH	11.7%	25.5%	8.8%	23.5%
TH and SH	6.1%	21.4%	3.2%	25.8%

Table 10. Relationships: Percentage on consultant rotas with Likert grade "Major" or "Regular" dependent on hospital type and gender.

Both mid-grades and consultants experienced substantially more relationship difficulties when telephoned out of hours, and dependent upon the frequency of that disturbance (Table 11).

Type of disruption	Frequency of disruption			
	Every night	Every 2-3 nights	Every 4-5 nights	Occasionally
Called by phone	38.5%	27.9%	22.1%	24.2%
Return to hospital	53.8%	38.5%	27.3%	24.2%

Table 11. Relationships: Percentage on consultant rotas reporting regular or major disruption from calls between midnight and 8 am for all hospital types.

The median consultant on-call rota for those with substantial relationship issues, and who were disturbed overnight, was 1 in 8 (Range 1-25, SD 3.65).

Wellbeing

On mid-grade rotas the median 10-point VAS score for global wellbeing was 6 (more than occasional disruption) (Range 1 – 10, SD 2.45) and 5 for consultant rotas (Occasional disruption (Range 1 – 10, SD 2.64). The greatest proportion of mid-grades and consultant felt that stamina, work efficiency and mental health were all occasionally impacted by being on-call (Table 12). Gender, age or hospital type had no impact on these indicators of wellbeing, but sleep disruption was a substantial issue for both groups.

Gender	Likert Rating Scale Point				
	Not an issue	Minor problem	Occasional disruption	Regular disruption	Major issue
Sleep quality	9.0%	16.3%	32.3%	28.5%	13.9%
Stamina	9.0%	23.5%	32.2%	26.6%	8.7%
Work efficiency	12.1%	23.9%	33.9%	22.5%	7.6%
Mental health	14.9%	22.8%	33.5%	20.1%	8.7%

Table 12. Wellbeing: Percentage of consultants Likert grading of perceived wellbeing issues related to on-call working.

Of 122 consultants who felt that sleep disruption was a regular or major problem there were no reported differences between those on-call in DGHs or THs and SHs, their gender or age (Figure 4).

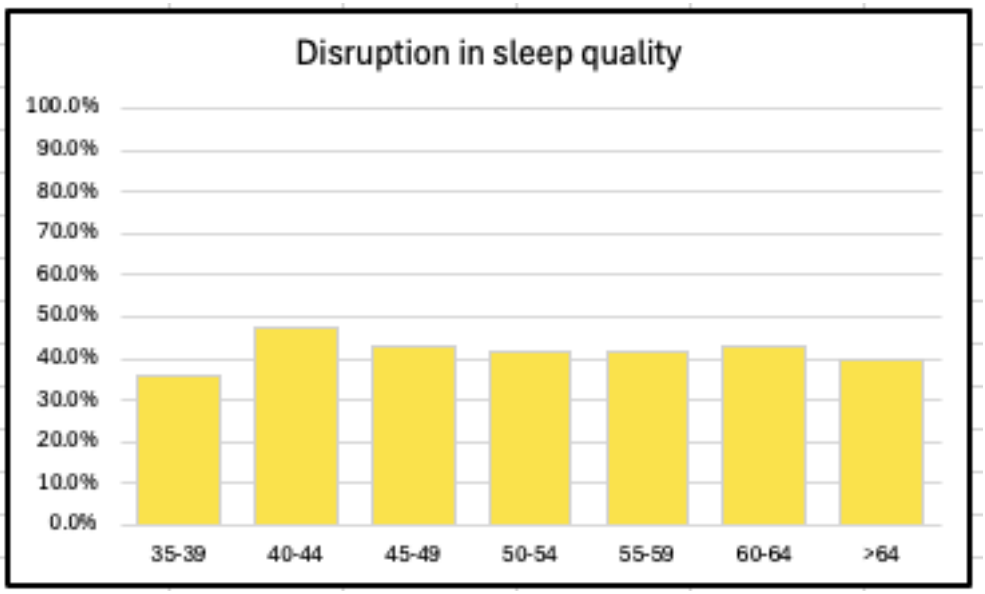

Figure 4. Sleep deprivation: Percentage Likert grade "Major" or "Regular" disruption to sleep dependent on consultant quinquennial age group.

Sleep disruption for both mid-grade and consultant rota participants was influenced by the frequency of disturbance between midnight and 8am, particularly if there was a need to return to hospital (Table 13). However, the small number on mid-grade rotas who were only disturbed occasionally had as bad a sleep quality as those being called more often. 7% on mid-grade rotas with substantial reduction in their sleep quality were resident on call and 38.6% of this group covered more than one hospital site out-of-hours.

Rota type	Type of disruption	Frequency of disruption			
		Every night	Every 2-3 nights	Every 4-5 nights	Occasionally
Consultant	Called by phone	46.2%	65.4%	29.8%	26.3%

	Return to hospital	100%	73.1%	61.6%	30.1%
Mid-grade	Called by phone	71.9%	51.7%	33.3%	62.5%
	Return to hospital	61.9%	75.7%	44.4%	63.6%

Table 13. Sleep deprivation. Percentage of all urologists reporting regular or major disruption to sleep quality dependent upon the frequency of calls between midnight and 8 am, for all hospital types.

The median consultant on-call rota for those with substantial issues with sleep quality, and who were disturbed overnight, was 1 in 8 (Range 1-25, SD 3.82).

Stress

The overall PSS scores for 423 individuals showed no significant differences in levels of stress attributable to on-call responsibilities as a consequence of the participant's gender (X^2 4.546, p= 0.337). The stress risk categories this cohort fell into, dependent upon their quinquennial age, are shown in Table 14. Age was significantly associated with perceived stress (X^2 = 27.49, p =0.036), with higher numbers than expected in the younger age groups reporting 'high' PSS scores.

Age group	n	Stress risk category and score		
		Low (0-13)	Medium (14-26)	High (27-40)
25-30	26	11.54%	61.54%	26.29%
31-34	49	26.53%	38.78%	34.69%
35-39	81	33.33%	34.57%	32.10%
40-44	84	25.00%	53.57%	21.43%
45-49	76	28.95%	48.68%	22.37%
50-54	78	33.33%	38.46%	28.21%
55-59	34	41.18%	50.00%	8.82%
60-64	8	62.50%	37.50%	0
>64	6	33.33%	66.67%	0

Table 14. Stress: Urologist's PSS scores, and stress category, as a percentage of those taking part in on-call dependent upon quinquennial age group.

The distribution of surgeons in the 'low' 'medium' and 'high' PSS categories between 45-49 years were more evenly distributed across categories and did not differ from the expected count. Urologists >55 years tended to report lower population stability index (PSI) than expected with a PSS between 27 and 30 (high stress) (Figure 5).

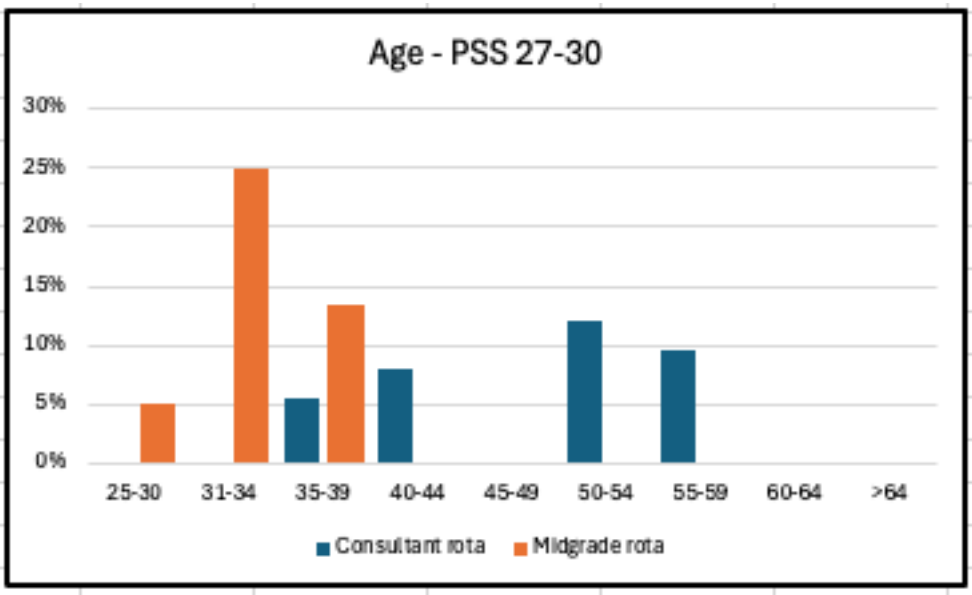

Figure 5. Stress: Urologist's taking part in on-call reporting stress scores >27, dependent upon age quinquennial.

In terms of stress related to occupational grade, there were significantly increased PSS scores for those on mid-grade rotas by comparison to consultants (X^2 = 7.92, p =0.019). More surgeons participating in mid-grade rotas were in the 'high' stress group than expected, although there was no significance dependent upon their stage of training (X^2 = 16.95, p =0.26). Fewer consultants were in the 'high' stress group than expected but the year of experience as a consultant was significantly associated with PSS; the highest PSS scores affected those mid-career (X^2 26.24, p= 0.003) (Table 15).

Years of experience	n	Stress risk category and score		
		Low (0-13)	Medium (14-26)	High (27-40)
<5	78	33.33%	52.56%	14.10%
6-10	74	28.38%	44.60%	27.03%
11-15	74	29.73%	48.65%	21.62%
16-20	38	44.74%	34.21%	21.05%
20-25	19	42.11%	47.37%	10.53%
>25 years	1	0	100%	0
R&R	5	60%	40%	0

Table 15. Stress: Consultant urologist's PSS scores, and stress category, for those taking part in on-call dependent upon years of experience in the specialty. (R&R = Retired and returned).

The hospital type individuals worked in had no bearing on their perceived stress levels (X^2 7.682, p= 0.104).

Looking at childcare, the extent to which caring responsibilities were an issue was significantly associated with increased stress. Where caring responsibilities were not an issue, or only a minor disruption, more participants than expected scored a low PSI. Where caring responsibilities were an occasional, regular disruption, or a major issue, more participants than expected scored in the medium, or higher, PSI groups than expected (X^2 = 45.26, p <0.001).

When categorising on call stress there was no significant association between rota frequency and PSI category (X^2 = 14.21, p =0.076).

Regarding on-call working patterns, surgeons who were called more frequently between midnight and 8am had significantly higher perceived stress (X^2 = 29.15, p < 0.001); more participants in the "very occasionally" on call group reported lower PSS scores than expected, while the participants reporting on call "every night" were more

likely to report high PSS scores than expected. This pattern was replicated when examining the consultant sample in isolation (X^2 = 22.16, p =0.001). Similarly, the frequency of needing to return to the hospital out-of- hours was significantly associated with elevated PSS (X^2 = 21.46, p = 0.002) (Table 16).

Call type	Call frequency	n	Stress risk category and score		
			Low (0-13)	Medium (14-26)	High (27-40)
Telephone	Every night	13	38.46%	23.08%	38.46%
	Every 2-3 nights	104	20.19%	62.50%	17.31%
	Every 4-5 nights	77	36.36%	42.86%	20.78%
	Occasionally	95	45.26%	35.79%	18.95%
Return to hospital	Every night	22	13.64%	27.27%	59.09%
	Every 2-3 nights	96	22.92%	45.83%	31.25%
	Every 4-5 nights	100	29.00%	49.00%	22.00%
	Occasionally	200	36.50%	42.50%	21.00%

Table 16. Stress: Urologist's PSS scores, and stress category, for those taking part in on-call dependent upon the frequency of being called, or having to return to hospital, between midnight and 8am.

Discussion

Irregular working hours are an inherent feature of many professions and are well-documented to negatively affect lifestyle, wellbeing, stress levels, and career longevity (19,32-34). For doctors, the expectation of 24-hour emergency availability is particularly disruptive and often results in physical, emotional, and mental exhaustion (3–11, 22, 25). This contributes to the early onset of burnout (3–11,19,29), which can diminish engagement and productivity, compromise patient safety (17,22,28), and prompt premature withdrawal from the urological workforce (2,28,29). It has been suggested that future career planning for clinicians should include discussions about retirement intentions over the age of 55 and that on call commitments to allow flexible working,

such as daytime only on-call, should be considered for those over 60 years of age (35). Similar aspirations have been proposed by BAUS (36).

Our findings indicate that most UK urologists experience a moderate impact on lifestyle and wellbeing from out-of-hours work, with less disruption to personal lives and WLB than experienced by other medical groups in the UK (3–9). Those urologists on mid-grade rotas and consultants working in district general hospitals (DGHs), with women disproportionately affected, seem to face the greatest disruption. Age and experience, more than gender or work setting (19,32,33), seem to shape how urologists experience these challenges. Younger doctors report higher stress from on-call duties, whereas older consultants perceive greater disruption to their work–life balance. This may reflect the reduction in flexibility and autonomy that accompanies ageing (37,38) rather than being due to any resistance to stress generated in the workplace (39). Whether these dynamics, seen in the global workforce, have specific relevance for the ageing urological workforce remains uncertain and is worthy of further exploration in future research.

Lifestyle disruptions are most closely tied to informal caring responsibilities, which affect trainees and younger consultants disproportionately. Although common across the workforce more broadly (40–42), this issue seems less acute among urologists than among other UK doctors (43). Solutions such as affordable childcare, flexible employer policies, or restructuring rotas into larger on-call teams to allow for greater accommodation of caring responsibilities (43-45) could help, but these are not universally accessible. Amalgamation into larger on-call teams would provide greater colleague flexibility, allowing greater tolerance of carer needs within departmental job planning (44,45). Importantly, any system must still ensure that individuals retain accountability for emergency call commitments, a challenge that is magnified in larger departments with less frequent, but more disruptive, rotas.

Sleep deprivation emerged as the most significant threat to wellbeing in this study. While some argue that merely being “on call” disrupts rest (23,46,47), our findings suggest that actual call frequency is the stronger driver of fatigue and stress. Those

most frequently disturbed, mid-grades and consultants in DGHs, have the greatest need for protected recovery periods. Alarmingly, prior studies found that only half of mid-grades, and very few consultants, receive sufficient rest following working between midnight and 8am (21). Inadequate recovery is known to contribute to impaired performance (48,49), heightened workplace stress (50,51), and burnout (28,29,34,52). Research has demonstrated that uninterrupted rest within 24 hours after sleep deprivation aids recovery, but a full 48 hours is needed to restore optimal functioning (18). With nearly half of UK consultants beginning their on-call weeks on a Monday (1), many are resuming elective clinical duties after weekends without adequate rest. Shifting on-call cycles to start and end on Fridays could enable more restorative recovery. Despite BAUS 2019 recommendations for adequate post-midnight rest (36), this standard is not consistently met, either for consultants or trainees (1).

Stress in surgical careers is multifactorial: some stressors stem from personality traits common among surgeons (53-55), others from workplace demands and team dynamics (18,23,47-52), and still others from external pressures including patient expectations (56) and medicolegal risk (24,25). Overall, more than 75% of UK urologists report experiencing low to moderate stress throughout their careers. However, for those with moderate to high stress, early recognition and proactive mitigation are crucial to sustaining clinical effectiveness, wellbeing, and job satisfaction. Long-term stress reduction strategies could also slow the current trend of consultants exiting practice before state pension age (2,35), thereby preserving vital experience within the workforce (35).

Limitations

This study represents the first focused analysis of stress associated with on-call work among UK urologists. It highlights key lifestyle disruptors and wellbeing challenges, particularly for trainees, younger consultants, and DGH-based urologists, while offering insights into drivers of stress that could lead to early burnout. However, the findings may not fully represent all UK urologists, as participation was limited to BAUS members with survey access. Subset analyses, especially across different mid-grade groups, were also limited by sample size and may lack robustness. Moreover, further research

is required to fully explain why senior consultants, despite greater experience, perceive greater intrusion from on-call work, nor does it clarify the relative impacts of sleep deprivation and caring responsibilities across career stages.

Conclusions.

For most urologists in our data, out-of-hours work is moderately intrusive but becomes more burdensome with age. Younger doctors experience greater stress, often linked to childcare demands and overnight emergency calls. To safeguard wellbeing, there is a clear need for tools to detect stress early and for structural adjustments in work scheduling, particularly around recovery periods following overnight duties. Ensuring accessible, protected rest is likely to be essential for sustaining both individual wellbeing and long-term workforce resilience.

3,532 words

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Supplemental file 1

Perceived Stress Score [30]

#	Question	Reverse Scored?
1	In the last month, how often have you been upset because something that you expected happened unexpectedly?	No
2	In the last month, how often have you felt that you were unable to control the important things in your life?	No
3	In the last month, how often have you felt nervous and "stressed"?	No
4	In the last month, how often have you felt confident about your ability to handle your personal problems?	Yes
5	In the last month, how often have you felt that things were going your way?	Yes
6	In the last month, how often have you found that you could not cope with all the things that you had to do?	No
7	In the last month, how often have you been able to control irritations in your life?	Yes
8	In the last month, how often have you felt that you were on top of things?	Yes
9	In the last month, how often have you been angered because of things that were outside of your control?	No
10	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	No

Option	Score	Reverse score
Never	0	4
Almost never	1	3
Sometimes	2	2
Fairly often	3	1
Very often	4	0

Score Range	Stress Level
0–13	Low stress
14–26	Moderate stress
27–40	High stress

Supplemental file 2

Demographic breakdown of participants with >90% data completeness.

Gender	Quinquennial (n)									Total number
	25-30	31-34	35-39	40-44	45-49	50-54	55-59	60-64	>64	
Male	14	32	52	60	59	65	33	4	5	324
Female	12	17	29	24	17	12	1	4	1	117

1 participant declined to declare their gender status

Employment grade	FY	CT	LED	ST	SAS	Consultant	Total number
n	1	8	27	88	29	289	442

Hospital type	Total number
District General Hospital	196
Teaching Hospital	207
Specialist Hospital	36

3 included participants did not give their institutional affiliation