

Supplementary Tables

Supplementary Table 1: Distribution of patients with single morbidity by morbidity type, mean of US exams and doctor visits over 15-year period

<i>Type of Morbidity</i>	Patients	US exams*	Doctor visits
	n (%) 11'399	Mean (CI) 1.70 (1.67 – 1.72)	Mean (CI) 8.80 (8.64 – 8.96)
<i>Pain and Inflammation</i>	6'099 (53.50)	1.64 (1.61 – 1.67)	9.08 (8.84 – 9.31)
<i>Peptic Ulcer</i>	1'707 (14.97)	1.83 (1.76 – 1.91)	7.69 (7.37 – 8.02)
<i>Hypertension</i>	550 (4.82)	1.67 (1.57 – 1.78)	9.78 (9.09 – 10.48)
<i>Vascular Diseases</i>	426 (3.74)	1.73 (1.58 – 1.87)	9.86 (8.87 – 10.86)
<i>Rheumatoid Arthritis</i>	400 (3.51)	1.76 (1.62 – 1.89)	8.85 (8.13- 9.58)
<i>Respiratory Illness/Asthma</i>	378 (3.32)	1.62 (1.48 – 1.75)	8.29 (7.68 – 8.91)
<i>Depression</i>	334 (2.93)	1.69 (1.54 – 1.84)	9.67 (8.85 – 10.48)
<i>Thyroid Disorders</i>	270 (2.37)	2.27 (2.04 – 2.49)	8.16 (7.40 – 8.92)
<i>Pain</i>	240 (2.11)	1.59 (1.43 – 1.76)	6.86 (6.03 – 7.68)
<i>Hyperlipidemia</i>	231(2.03)	1.84 (1.68 – 2.00)	8.27 (7.44 – 9.09)
<i>Anxiety and Tension</i>	197 (1.73)	1.64 (1.45 – 1.83)	6.81 (6.01 – 7.61)
<i>Cardiovascular</i>	175 (1.54)	1.69 (1.43 – 1.94)	9.56 (7.82 – 11.30)
<i>Cystic Fibrosis</i>	174 (1.53)	1.58 (1.41 – 1.75)	6.26 (5.56 – 6.96)
<i>Diabetes</i>	72 (0.63)	1.85 (1.42 – 2.27)	11.35 (9.34 – 13.36)
<i>Psychotic illness</i>	36 (0.32)	1.64 (1.23 – 2.04)	12.62 (7.45 – 17.78)
<i>Crohn's and Ulcerative Colitis</i>	33 (0.29)	1.60 (1.34 – 1.87)	12.00 (6.46 – 17.54)
<i>Epilepsy</i>	23 (0.20)	1.91 (1.25 – 2.58)	12.70 (6.72 – 18.67)
<i>Malignancies</i>	23 (0.20)	1.65 (1.23 – 2.08)	10.48 (7.73 – 13.22)
<i>Parkinson's</i>	12 (0.11)	1.25 (0.96 – 1.54)	9.42 (4.27 – 14.57)
<i>Gout</i>	10 (0.09)	1.00 (1)	4.10 (2.40 – 5.80)
<i>Glaucoma</i>	5 (0.04)	1.40 (0.72 – 2.08)	12.40 (1.14 – 23.66)
<i>Transplants</i>	3 (0.03)	1.34 (-0.10 – 2.77)	25.67 (-13.64 – 64.97)
<i>HIV and AIDS</i>	1 (0.01)	2.00 (-)	10.00 (-)

US: ultrasound; CI: Confidence Interval at 95% significance level

A dash (-) denotes that there were no observations under this group

*The total number of US exams for patients with single morbidity is 19'356

Supplementary Table 2: Yearly distribution of US exams, frequency of patients and GPs and US productivity

Year* n=15	Patients † n= 67'180	GP † n= 104	US exams n=130'245	US productivity‡ n= 96
	n (%)	n (%)	n (%)	n (mean; CI)
2004	2'496 (3.7)	39 (37.5)	3'133 (2.4)	39 (149.64; 82.67 - 216.62)
2005	2'942 (4.4)	41 (39.4)	3'712 (2.9)	41 (162.47; 95.09 - 229.85)
2006	3'757 (5.6)	48 (46.2)	4'746 (3.6)	48 (153.95; 95.05 - 212.85)
2007	4'141 (6.2)	52 (50.0)	5'167(4.0)	49 (152.05; 94.27 - 209.83)
2008	6'242 (9.3)	49 (47.1)	8'199 (6.3)	48 (161.75; 103.94 - 219.57)
2009	6'004 (8.9)	52 (50.0)	7'980 (6.1)	52 (152.07; 97.74 - 206.41)
2010	6'693 (10.0)	52 (50.0)	9'011 (6.9)	52 (161.09; 107.61 - 214.58)
2011	7'367 (11.0)	54 (51.9)	9'909 (7.6)	53 (159.33; 106.63 - 212.03)
2012	6'878 (10.2)	59 (56.7)	9'156 (7.0)	57 (152.04; 102.45 - 201.64)
2013	6'771 (10.1)	67 (64.4)	8'839 (6.8)	66 (152.49; 107.96 - 197.01)
2014	8'092 (12.0)	73 (70.2)	10'827 (8.3)	68 (159.16; 114.67 - 203.64)
2015	9'409 (14.0)	74 (71.2)	13'093 (10.1)	70 (166.15; 122.25 - 210.05)
2016	10'030 (14.9)	79 (76.0)	14'042 (10.8)	75 (159.79; 118.25 - 201.33)
2017	9'916 (14.8)	83 (79.8)	13'645 (10.5)	78 (155.42; 115.20 - 195.64)
2018	6'622 (9.9)	79 (76.0)	8'786 (6.7)	76 (148.45; 108.01 - 188.90)

US: ultrasound; CI: Confidence Interval at 95% significance level

*2018 data is up to 30 September 2018

† Total percentage is more than 100

‡ The overall mean of US productivity is 128.72 for 96 GPs, the mean of US exams per year is 9937.24; n = number of GPs for that specific year

Supplementary Table 3: Non-POCUS indications of ultrasound use

	Present use*	Anticipated use*	
		Current users	Non-users
Total	n=54	n=23	n=7
Abdomen†	52 (96)	14 (61)	7 (100)
<i>Liver disease assessment, n (%)</i>	48 (92)	2 (14)	4 (57)
<i>Splenomegaly, n (%)</i>	48 (92)	2 (14)	6 (86)
<i>Pancreas assessment, n (%)</i>	38 (73)	4 (29)	4 (57)
<i>Obstructive jaundice, n (%)</i>	42 (81)	6 (43)	4 (57)
<i>Renal colic, n (%)</i>	44 (85)	5 (36)	5 (71)
<i>Appendicitis, n (%)</i>	36 (69)	6 (43)	3 (43)
<i>Diverticulitis, n (%)</i>	30 (58)	5 (36)	4 (57)
<i>Hernia, n (%)</i>	24 (46)	6 (43)	2 (29)
<i>Abdominal trauma, n (%)</i>	33 (63)	2 (14)	5 (71)
<i>Irritable bowel disease, n (%)</i>	18 (35)	4 (29)	2 (29)
<i>Bladder diseases, n (%)</i>	37 (71)	4 (29)	5 (71)
<i>Evaluation of the prostate, n (%)</i>	40 (77)	3 (21)	4 (57)
<i>Testicular torsion, n (%)</i>	16 (31)	4 (29)	1 (14)
<i>Testicular pain, n (%)</i>	24 (46)	3 (21)	1 (14)
<i>Testicular inflammation, n (%)</i>	20 (38)	3 (21)	1 (14)
Cardiac†	7 (13)	8 (35)	1 (14)
<i>Evaluation of ventricular size and function, n (%)</i>	4 (57)	8 (100)	1 (100)
<i>Undifferentiated hypotension, n (%)</i>	6 (86)	6 (75)	-
<i>Valvular assessment, n (%)</i>	2 (29)	5 (63)	1 (100)
Vascular†	18 (33)	7 (30)	1 (14)
<i>Intima-media thickness / Carotid plaque, n (%)</i>	17 (94)	4 (31)	-
<i>Jugular venous distention, n (%)</i>	5 (28)	4 (31)	1 (100)
Thoracic†	29 (54)	12 (52)	5 (71)
<i>Ribs fractures, n (%)</i>	25 (86)	10 (83)	5 (100)
<i>Chest pain OR Shortness of breath OR Dyspnea, n (%)</i>	11 (38)	5 (42)	1 (20)
<i>Auscultatory Changes in the lungs, n (%)</i>	9 (31)	7 (58)	1 (20)
<i>Chest trauma, n (%)</i>	14 (48)	6 (50)	3 (60)
Women's Reproductive Health†	14 (26)	3 (13)	-
<i>Ovarian pathology, n (%)</i>	12 (86)	3 (100)	-
<i>First term pregnancy, n (%)</i>	5 (36)	2 (67)	-
<i>Ruptured ectopic pregnancy, n (%)</i>	3 (21)	2 (67)	-
<i>Abnormal vaginal Bleeding, n (%)</i>	6 (43)	2 (67)	-
<i>Uterine ultrasound OR uterine mass assessment, n (%)</i>	11 (79)	2 (67)	-
Musculoskeletal & Other conditions†	43 (80)	17 (74)	3 (43)
<i>Fracture, n (%)</i>	12 (28)	8 (47)	2 (67)
<i>Joint effusion, tendon or ligament rupture, n (%)</i>	21 (49)	6 (35)	3 (100)
<i>Joint assessment and muscular injuries, n (%)</i>	16 (37)	5 (29)	-
<i>Evaluation of rheumatoid arthritis, n (%)</i>	4 (9)	3 (18)	1 (33)
<i>Thyroid OR Parathyroid, n (%)</i>	31 (72)	9 (53)	1 (33)
<i>Adrenal screening, n (%)</i>	8 (19)	4 (24)	-
<i>Evaluation of lymph nodes OR Palpable neck mass, n (%)</i>	33 (77)	5 (29)	-
<i>Abscesses and cysts, n (%)</i>	38 (88)	4 (24)	2 (67)

*Total percentages do not add to 100%.

†Overall number of GPs using and/or anticipating using ultrasound for respective bodily systems/areas excluding POCUS targeted indications

A dash (-) denotes that there were no observations under this group

Supplementary Table 43: Views of GPs on different aspects of US use

	Present use*	Anticipated use		
		Current users*	Non-users*	
General Reasons	Total	53	5	6
	<i>Standard of practice, n (%)</i>	41 (77)	2 (40)	2 (33)
	<i>Availability of the machine at practice, n (%)</i>	36 (68)	-	3 (50)
	<i>Reputation of the practice, n (%)</i>	9 (17)	2 (40)	1 (17)
	<i>Patient's comfort and convenience, n (%)</i>	30 (57)	-	3 (50)
	<i>Financial benefit, n (%)</i>	9 (17)	4 (80)	3 (50)
	<i>Faster diagnosis and earlier medical intervention, n (%)</i>	48 (91)	-	5 (83)
	<i>Other †, n (%)</i>	3 (6)	-	-
Medical Purposes Total		54	3	7
	<i>Diagnostic, n (%)</i>	54 (100)	-	7 (100)
	<i>Therapeutic, n (%)</i>	22 (41)	2 (67)	-
	<i>Treatment evaluation, n (%)</i>	23 (43)	1 (33)	1 (14)
Relevance of US Skills to Practice Total		54		7
	<i>Very relevant, n (%)</i>	27 (50)	-	1 (14)
	<i>Somewhat relevant, n (%)</i>	24 (44)	-	3 (43)
	<i>Neither relevant nor irrelevant, n (%)</i>	3 (6)	-	2 (29)
	<i>Somewhat irrelevant, n (%)</i>	-	-	1 (14)
	<i>Very irrelevant, n (%)</i>	-	-	-
Comfort with US for Clinical assessment Total		54		7
	<i>Very comfortable, n (%)</i>	20 (37)	-	-
	<i>Somewhat comfortable, n (%)</i>	24 (44)	-	4 (57)
	<i>Neither comfortable nor uncomfortable, n (%)</i>	9 (17)	-	2 (29)
	<i>Somewhat uncomfortable, n (%)</i>	1 (2)	-	1 (14)
	<i>Very uncomfortable, n (%)</i>	-	-	-
Comfort with US for Guided procedures Total		16		1
	<i>Very comfortable, n (%)</i>	4 (25)	-	-
	<i>Somewhat comfortable, n (%)</i>	9 (57)	-	-
	<i>Neither comfortable nor uncomfortable, n (%)</i>	2 (12)	-	1 (100)
	<i>Somewhat uncomfortable, n (%)</i>	1 (6)	-	-
	<i>Very uncomfortable, n (%)</i>	-	-	-

US: ultrasound; 54 GPs are presently using ultrasound, 7 GPs are not using ultrasound at their practices.

*Total percentage does not add to 100, GPs may have multiple selections.

† Other reasons included emergency (2), reduced cost for patients (1)

A dash (-) denotes that there were no observations under this group

Supplementary Table 4: Frequency of GPs presently using or anticipating to use ultrasound for the targeted indications of POCUS

<u>POCUS targeted indications</u>	<u>Present use*</u>	<u>Anticipated use*</u>	
	<u>n=54</u>	<u>Current users</u>	<u>Non-users</u>
	<u>n (%)</u>	<u>n=17</u> <u>n (%)</u>	<u>n=7</u> <u>n (%)</u>
<u>Pericardial effusion</u>	<u>33 (61)</u>	<u>4 (24)</u>	<u>6 (86)</u>
<u>Pneumothorax</u>	<u>19 (35)</u>	<u>10 (59)</u>	<u>3 (43)</u>
<u>Pleural effusion</u>	<u>42 (78)</u>	<u>5 (29)</u>	<u>4 (57)</u>
<u>Cholecystolithiasis</u>	<u>49 (91)</u>	<u>4 (24)</u>	<u>7 (100)</u>
<u>Cholecystitis</u>	<u>46 (85)</u>	<u>6 (35)</u>	<u>6 (86)</u>
<u>Free fluid in the abdomen</u>	<u>50 (93)</u>	<u>4 (24)</u>	<u>7 (100)</u>
<u>Kidney congestion</u>	<u>50 (93)</u>	<u>4 (24)</u>	<u>5 (71)</u>
<u>Abdominal aortic aneurysm</u>	<u>42 (78)</u>	<u>6 (35)</u>	<u>5 (71)</u>
<u>Bladder filling condition</u>	<u>49 (91)</u>	<u>2 (12)</u>	<u>7 (100)</u>
<u>Deep venous thrombosis</u>	<u>28 (52)</u>	<u>8 (47)</u>	<u>1 (14)</u>
<u>US for guided procedures</u>	<u>14 (26)</u>	<u>-</u>	<u>-</u>
<u>US for pain management</u>	<u>4 (7)</u>	<u>-</u>	<u>-</u>

Targeted indications of POCUS according to SGUM POCUS education module

*Total percentage does not add to 100, many GPs perform more than one US type

A dash (-) denotes that there were no observations under this group