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Jenna Paulson, B Phil (Hons.), Cornell University; MPH, Western University; MB BCh BAO (C) RCS MUB In this clinical audit, raw patient data was extracted from the Histopathology Patient Record Books and EMR from Septembe 2014 to January 2017, inclusive, at Bahrain Defense Military Hospital In West Riffa, Kingdom of Bahrain. A comparative best practice guideline, the NICE Bladder Biopsy Clinical Audit Tool, was adhered to throughout the data collection process. Excerpted items included basic patient features such as Age and Sex, and elaborate, pathology-specific details such a patient management plan. This paper has 2 principal aims: (1) to assess local practice guidelines around acquisition of bladder tisopsy at BDF Hospital through use of a best-practice clinical tool. Ultimately, this retrospective clinical audit focusses on aspects of diagnostic workup referal and triatal management pathways. Introduction In the Kingdom of Bahrain, extensive and comprehensive health care is afforded to the entire population of 1.425 million (The world Bank Group, 2016), and comprises a great array of primary, secondary, and tertiary care services, with preventative, prophylactic, and rehabilitative foci that are available a too world sustanable community-wide health core care, services of throughout and sustanable community-wide health care centres and clinics. These centres are located throughout the five governorates of throughout the five governorates of thurvesty Hospital (RHUM), and Salmaning Medical Complex SMC). SMC has 1200 beds, and provides hiefly secondary health rervices, which includes potyhiatic and geriatric care institutions, Jus four maternity health facilities (World Health Organizaton) subs four maternity health facilities (World Health Organizaton) Subs four maternity health facilities (World Health Organizaton) subs four maternity health facilities (World Health Organizaton) sus four maternity	PARIPEN SEATON	CLIN HIST SPEC	ICAL AUDIT ON THE DIAGNOS OPATHOLOGICAL STAGING O IMENS AT BDF HOSPITAL IN E	STIC WORKUP AND F BLADDER BIOPSY BAHRAIN	KEY WOR Audit, Histop	IDS: Bladder, Biopsy, athology
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 To collect patient data from histopathology records (Patholog Record Books and EMR) at BDF Military Hospital between the months of December 2014 and January 2017, inclusive. To review records and narrow the patient data pool to bladd biopsies taken during this time period. To review records and narrow the patient data pool to bladd biopsies taken during this time period. To extract records and enter selected data into the NIC Clinical Audit Tool (National Collaborating Centre for Cancer 2017, p.4) for Bladder Biopsy and use this to streamline result to collate the information collected and organise it within the NICE Clinical Audit Tool (See Table 1, Annexes 1 and 2). 	Introduction In the Kingdom of Bacare is afforded to t World Bank Group, 2 secondary, and te prophylactic, and re publicly funded and subsidised such that receive care from a c care, which ultimately and sustainable comma a network of 23 print centres are located Kingdom of Bahrain.	ahrain, ex he entire D16), and tiary ca habilitativ private ooth Bahr linic in tha y enables nunity-wi nary heal throughc	tensive and comprehensive health population of 1.425 million (The comprises a great array of primary, re services, with preventative, e foci that are available at both facilities. Healthcare provision is aini and non-Bahraini persons can eir catchment area. Primary health Bahrainis have access to affordable de health coverage, is provided via th care centres and clinics. These ut the five governorates of the	Public health care is provid hospital in Bahrain just at hospital is managed by the West Riffa, Southern Gov nearly one third of the E 2018). This institution prov Bahrain defense force, thei well as emergency and his the whole population. Aims and Methods Student learning outcomes Selected Component inclu	ded by BDF Hos fter the SMC, a e Ministry of De ernorate. BDF s Bahrain populat vides health ser ir families, and a ghly specialised s decided at the ded the followir	pital, the second larges and has 350 beds. BD efense, and is located in serves a catchment are tion (Serageldien et al vices to members of the mixed civilian cohort, a cardiac care services t initiation of the Studer ng:
	n addition to 13 priva 2012), there are 3 go 2017): Bahrain Def Jniversity Hospital ((SMC). SMC has 1200 care, which includes (X-Ray, CT, and MI services, which includes olus four maternity h 2007).	te health o vernment ense For KHUH), a) beds, an dentistry RI). SMC de psychia lealth fac	care clinics (Oxford Business Group, hospitals (Bahrain Property World, ce Hospital (BDF), King Hamad and Salmaniya Medical Complex d provides chiefly secondary health and advanced imaging test access houses more specialised health tric and geriatric care institutions, lities (World Health Organization,	 To collect patient data Record Books and EM months of December 2 To review records and biopsies taken during t To extract records ar Clinical Audit Tool (Na 2017, p.4) for Bladder To collate the information NICE Clinical Audit Tool 	from histopatho R) at BDF Milita 1014 and Januar narrow the pati his time period his time period tional Collabora Biopsy and use t tion collected an ol (See Table 1, A	blogy records (Patholog ry Hospital between th y 2017, inclusive. ent data pool to bladde ed data into the NIC ating Centre for Cance this to streamline results and organise it within th annexes 1 and 2).
	Report number				%	0/0
Report number % 0/0	Administrative Patier	it Demog			100/	0/00
Report number % 0/0 Administrative Patient Demographics	Dationt records daring				111/0	10/01/

Patient records derived from the 2014-2015 calendar year	10%	8/80
Patient records derived from the 2015-2016 calendar year	35%	28/80
Patient records derived from the 2016-2017 calendar year	55%	44/80
Sex		
Male	91.25%	73/80
Female	8.75%	7/80
Symptoms present prior to bladder Bx	·	
Haematuria (e.g. microhaematuria, gross)		
Υ	60%	48/80
N	40%	32/80
Polyuria		
Υ	23.75%	19/80
N	76.25%	61/80
Dysuria		
Υ	25%	20/80
Ν	75%	60/80
Presence or absence of lumbago		
Υ	42.5%	34/80
Ν	57.5%	46/80

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Done as part of cystoscopy or TURBT (Cancer Research UK, 2015) procedure?		
Y cys + TUR	83.75%	67/80
Y cys only	13.75%	11/80
N ¹	28.75%	23/80
Details regarding bladder cancer if present in the bladder Bx sample		
Recurrence history		
Y	25%	20/80
N	75%	60/80
Size and number of cancers	1	
Y, size and number ²	0%	0/80
Y size ³ only	58 75%	47/80
N	2.5%	2/80
Histological type		-,
Papillary transitional cell carcinoma	42.5%	34/80
	23 53%	8/34
Non-invasive	76 / 7%	26/34
Invasive nanillary transitional cell carcinoma with invasion to prostate	2.5%	2/80
	2.3%	17/80
	20.410/	5/17
Chronic active cystitis	17 65%	2/17
Delynoid cystitic	17.05%	2/17
Repign ulceration with chronic active cyctitic	5 880/	1/17
Chronic follicular avetitie	J.0070	1/17
	J.ÖÖ%	1/17
Cystilis Cystica Cystitis alandularia	D.88%	1/17
	5.88%	1/1 /
Masked acute on chronic cystitis	5.88%	1/1 /
Mild chronic cystitis	5.88%	1/1 /
Invasive transitional cell carcinoma	8.75%	7/80
Benign prostatic hyperplasia	6.25%	5/80
Inflammation	2/80	
Mild	50%	1/2
Mild chronic acute	50%	1/2
Other nonspecific	20/80	
Nested variant of urothelial carcinoma of urinary bladder	2.5%	2/80
Nonspecific granuloma	2.5%	2/80
No recurrence, no defects, no extravasation	1.25%	1/80
Oedema with vascular congestion	1.25%	1/80
Polypoidal cryptitis	1.25%	1/80
Urothelial carcinoma	1.25%	1/80
Acutely inflamed granulation tissue	1.25%	1/80
Endometriosis	1.25%	1/80
Intraurothelial neoplasia	1.25%	1/80
Insufficient for opinion	1.25%	1/80
Invasive adenocarcinoma	1.25%	1/80
Keratinising squamous cell carcinoma	1.25%	1/80
Severe dysplasia	1.25%	1/80
Thickened deep muscle	1.25%	1/80
Ureteric papilloma	1.25%	1/80
Urothelial carcinoma with focal areas of squamous metaplasia	1 25%	1/80
Urothelial papillary hyperplasia	1 25%	1/80
Well-differentiated liposarcoma/atypical lipomatous neoplasm	1 25%	1/80
Grade	112070	.,
Grade 1/well differentiated/low grade	21 25%	17/80
Grade 2/moderately differentiated/intermediate grade	21.25%	17/80
Grade 3/noorly differentiated/high grade	37.5%	30/80
Negative for malignancy	3 75%	3/80
No grade given	1 25%	1/80
Other descriptor given	1.2.5 /0	1700
Stane ⁴	1.570	12/00
PTic	1 25%	1/80
	10%	8/80
	1 25%	1/80
	2 50/	2/20
DT1	21 250/	2/00
	1 250/	23/00
	1.20% E0/	1/80
	5% F0/	4/8U
	ング ファッ/	4/80
	2.5%	2/ðU
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PT4a	2.5%	2/80
No stage given	37.5%	30/80
Presence or absence of flat urothelium	57.570	50/00
	0%	0/80
N	58 75%	/7/80
	/1 25%	33/80
Prodicted rick of recurrence ⁵	41.2370	55/00
	25.0/	20/80
	750/	20/80
Prodicted rick of prograssion ⁶	1 5 /0	00/80
	1 250/	1/00
N	09 75 %	70/20
Treatment entions utilised in nations management plan if bladder cancer was present	90.7570	79/80
	600/	49/90
I URB I	1 250/	48/80
	1.25%	1/80
	1.25%	1/80
Intravesical chemotherapy	6.25%	5/80
Systemic chemotherapy	5%	4/80
Radiotherapy	5%	4/80
Immunotherapy"	10%	8/80
Descriptive Patient Characteristics/Comments	70/00	
	/8/80	26/00
Hypertension	45%	36/80
DM or prediabetic	40%	32/80
Hyperlipidaemia or dyslipidaemia	30%	24/80
ACS (i.e. acute STEMI, NSTEMI or unstable angina)	21.25%	17/80
BPH	15.49%	11/71
OAB	7.5%	6/80
Ischaemic stroke	5%	4/80
H/O angioplasty or other coronary artery stenting	5%	4/80
Hypothyroidism	3.75%	3/80
Renal calculi	3.75%	3/80
Other medications		
Non-NSAID analgesics/antipyretics (e.g. acetaminophen codeine phosphate, paracetamol)	66.25%	53/80
Antibiotics (e.g. cyclosporine, trimethoprim, levofloxacin, cefuroxime, augmentin, ciprofloxacin)	48.75%	39/80
α1 antagonists (e.g. tamsulosin, alfuzosin)	31.25%	25/80
Antihyperglycaemics (e.g. metformin, glargine, lantus, glulisine, gliclazide, mixtard)	23.75%	19/80
M3 antagonists (e.g. solifenacin succinate)	23.75%	19/80
Beta blockers (e.g. atenolol, bisoprolol)	15%	12/80
Statins (e.g. simvastatin)	15%	12/80
Calcium channel blockers (e.g. amlodipine)	13.75%	11/80
Osmotic laxatives (e.g. lactulose) (10/80)	12.5%	10/80
Diuretics (e.g. hydrochlorothiazide, furosemide, spironolactone)	8.75%	7/80
NSAIDs (e.g. diclofenac, aspirin)	8.75%	7/80
Immunotherapeutic agents (e.g. intravesical BCG)	6.25%	5/80
Nitrates (e.g. glyceryl trinitrate)	6.25%	5/80
Proton pump inhibitors (e.g. omeprazole)	6.25%	5/80
5 -reductase inhibitors (e.g. dutasteride)	5%	4/80
Antispasmodics (e.g. hyoscine, oxybutynin)	5%	4/80
ACE inhibitors (e.g. perindopril)	3.75%	3/80
Anticonvulsants (e.g. pregabalin, sodium valproate)	3.75%	3/80
Antiplatelets (e.g. clopidogrel)	3.75%	3/80
Corticosteroids (e.g. prednisolone)	2.5%	2/80
Anticoagulants (e.g. warfarin)	2.5%	2/80
Surgical history (e.g. cardiac, GU, bariatric)		
Y	25%	20/80
Ν	75%	60/80
Smoker		
Υ	6.25%	5/80
Ν	16.25%	13/80
Exception ¹¹	77.5%	62/80
Recreational drug/alcohol use		
Y ¹²	1.25%	1/80
Ν	98.75%	79/80
[**	1	

Results

Data analyses were conducted with Excel 2017, Version 15.32, and inherent Function tools to organise the data sheet and draw conclusions therein contained. Descriptive statistics were also

utilised (i.e. measures of central tendency, such as mean). This study was approved by the Ethics Committee of the Bahrain Defence Force Military Hospital.

The raw patient data extracted during the clinical audit were chosen using a comparative best practice guideline (NICE, 2017, p. 4), the NICE Bladder Biopsy Clinical Audit Tool (See Annexes 1 and 2). These selected data items focussed on a specific patient population undergoing bladder biopsy at BDF Hospital, who were referred from other departments in the institution (e.g. Urology or Surgery). These items included basic demographic features such as Date of Bladder Biopsy, Age, Sex, Referring Clinician, Ward/Department Referred from, and more advanced, pathology-specific details such as Histopathological Specimen Analysed and Technique of Tissue Extraction Utilised, Histopathological Diagnosis made (e.g. PT4), Grade, Stage, and treatment-specific particularities, such as whether Chemotherapy, Radiotherapy, or Immunotherapy were included in the patient management plan.

Ultimately, data from 80 canvassed patient records yielded important conclusions (See Table 1). First, the majority of referrals for histopathological diagnosis with suspected bladder carcinoma were males (88.8%) and the remainder, females (11.2%). Of all extracted cases, 96.25% were referred from Urology, 3.75% were referred from Surgery, and only 1% of those from the Surgery Day Ward. The top 5 most commonly encountered comorbidities in patients diagnosed with bladder carcinoma undergoing TURBT with guided flexible cystoscopy were hypertension (45%), Type 2 diabetes mellitus (40%), dyslipidaemia (30%), acute coronary syndrome (21.25%), and benign prostatic hyperplasia (13.75%). Strikingly, of all patients with suspected bladder carcinoma, at the time of diagnosis, only 6.25% of patients identified as nonsmokers. 16.25% were smokers, and 77.5% declined to disclose their smoking status. The most regularly encountered drug classes taken by the study cohort with suspected bladder cancer included non-NSAID analgesics/antipyretics (66.25%), antibiotics (48.75%), alpha-1 antagonists (31.25%), antihyperglycaemics (23.75%), and M3 antagonists (23.75%). 25% of patients had a past surgical history of either cardiac, genitourinary or bariatric nature, and 75% of patients had no past surgical history.

With regards to symptoms present prior to bladder biopsy, 60% of patients reported haematuria, 23.75% reported polyuria, 25% reported dysuria, and 42.5% reported lumbago. The standard procedure involved in obtaining tissue specimens for procedure for histopathological examination at the BDF Pathology lab is via TURBT and/or cystoscopy procedure (Stephenson, 2016; National Collaborating Centre for Cancer, 2015). Of note, 83.75% of patients underwent only TURBT; 70% of these cases underwent TURBT plus flexible cystoscopy. Only 13.75% of cases did not undergo cystoscopy, and in 28.75% of cases, the technique or method of specimen collection was not reported.

The manner of documenting bladder biopsy histopathological features is crucial to this clinical audit. These details were consistently remarked upon in the BDF Pathology Record Books, a hard copy form of record-keeping, and reported on the (1) Histological Type of bladder specimen; (2) Size and number of cancers; (3) Grade; and (4) Stage. The presence or absence of flat urothelium was not mentioned in the inspected patient records. The most commonly encountered histological type of bladder specimen identified in the pathologist's report was papillary transitional cell carcinoma (42.5%), of which 76.47% of cases were invasive, and 23.53% non-invasive; cystitis (21.25%), of which subtypes included chronic cystitis (29.41%), chronic active cystitis (17.65%), or polypoid cystitis (17.65%); invasive transitional cell carcinoma (8.75%); and lastly, benign prostatic hyperplasia (6.25%)¹³; or was reported as simply 'inflammation' (2.5%), where subtypes included mild and mild chronic acute.. In only 1.25% of cases was the bladder specimen insufficient for opinion, and in 2.5% of cases, no pathological report was found in the records.

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^{3.} Size of cancers was inconsistently remarked upon.

- Staging was done for most histopathological samples where the diagnosis listed mentioned carcinoma of bladder tissue; however, in many cases, no stage was given. In these instances, the biopsy or cystoscopy sample was either (1) not bladder cancer (e.g. endometriosis, cystitis, acutely inflamed granulation tissue, etc); (2) bladder cancer, but no stage was mentioned (or was instead stated in words instead of using the standard TNM staging terminology); or (3) missing data altogether, and the information was found elsewhere (i.e. the patient's EMR). Importantly, nodes and mets were rarely commented on in the pathologist's staging report.
- ^{5.} Predicted risk of recurrence was not mentioned in the EMR. However, patients presenting with bladder cancer recurrence were mentioned in 20/80 patient records in the EMR, and was always written into the patient notes by either a referring Urologist (19/20) or Surgeon (1/20).
- In only 1/80 cases did the patient notes written by the Urologist mention a patient (1) with recurrent bladder carcinoma, (2) with inoperable bladder carcinoma, and (3) for whom chemotherapy was contraindicated, due to comorbidities. It may be inferred from the above case, though it was not mentioned explicitly, that the patient's case has an associated poor prognosis.
- ^{7.} 5/80 cases mentioned use of mitomycin C intravesical injection 24 h following TURBT procedure.
- Despite patient records mentioning 'chemotherapy' for particular patients, the specific chemotherapeutic regimen was never mentioned (e.g. cisplatin + gemcitabine; carboplatin + gemcitabine; MVAC; or DD-MVAC)
- ⁹ 4/80 cases mentioned use of radiotherapy and always where use of chemotherapeutic agents was noted.
- ^{10.} 8/80 cases mentioned administration of intravesical BCG; there was no mention of immunotherapy provision with interferon or PD1 inhibitors in the EMR.
- ^{11.} 62/80 cases did not report a history of cigarette smoking or declined to answer.
- ¹² There was only 1 case of reported recreational alcohol use in the patient EMR, where the patient identified as an alcoholic.
- ¹³ viz., where a bladder carcinoma was suspected by similar symptomatology or patient presenting complaint that turned out to an unrelated non-malignant pathology.

Importantly, grading and staging of bladder biopsy specimens occurred in all cases where a biopsy specimen was sufficient for a pathological diagnosis to be made. The most frequently identified grades of biopsy specimens were grade 1/well differentiated/low grade (21.25%); grade 2/moderately differentiated/intermediate grade (21.25%); grade 3/poorly differentiated (37.5%); and negative for malignancy (3.75%). In 15% of cases, no gradespecific pathological descriptor was given.

Staging was done for most histopathological samples where the diagnosis listed mentioned carcinoma of bladder tissue; however, in many cases, no stage was given. In these instances, the biopsy or cystoscopy sample was either (1) not bladder cancer (e.g. endometriosis, cystitis, acutely inflamed granulation tissue, etc); (2) bladder cancer, but no stage was mentioned (or was instead stated in words instead of using the standard TNM staging terminology); or (3) missing data altogether, and the information was found elsewhere (i.e. the patient's EMR). Importantly, nodes and mets were rarely commented on in the pathologist's staging report. When a stage was listed, the most frequently encountered stages included: (1) PT1 (31.25%); (2) PTa (10%); PT2a (5%); and finally, PT2 (5%). Overall, 5% of canvassed cancer cases presented with advanced tumors (either regional or distant mets) at the time of histopathological diagnosis (100% in males, where invasion into the prostatic duct occurred in 2/4 instances). 56.25% of patients presented with localised tumors and 1.25% with bladder carcinoma in-situ. The extent of cancer went unreported in 37.5% of patients (83% in males and 17% in females).

Additional details regarding bladder biopsy were mentioned in the patient EMR (See Table 2). These included (1) predicted risk of recurrence and progression; (2) treatment options utilised in

^{1.} These cases did not indicate the technique/method of specimen collection employed.

² Number of cancers was not remarked upon, however location and depth of invasion was always noted (e.g. bladder neck, L. posterolateral, bladder trigone, L. ureteric orifice, NMIBC, MIBC, etc).

patient management plan if bladder cancer was present; (3) specific chemotherapeutic, radiotherapeutic, or immunotherapeutic regiments utilised. Predicted risk of recurrence was never mentioned in the patient notes on the EMR. However, a significant proportion of patients referred for bladder biopsy had a history of recurrence in 25% of cases. In only 1.25% of cases did a patient record mention risk of progression to a more metastatic, high-grade version of bladder cancer.

Now, as pertains to specialised therapeutic measures for patients with confirmed bladder biopsy and history of recurrence, 6.25% patient records mentioned use of mitomycin C intravesical injection 24 h following TURBT procedure; 5% of cases mentioned use of chemotherapeutic agents, but did not specify the regimen utilised (e.g. cisplatin + gemcitabine, MVAC or other); 5% of cases mentioned use of radiotherapy, and in each case, there was always concurrent use of chemotherapeutic agents; finally, 10% of patient records mentioned use of immunotherapeutic modulators, specifically, administration of intravesical BCG. There was no mention of immunotherapy with interferon or PD1 inhibitors (e.g. nivolumab).

Finally, other descriptive patient characteristics or comments were sporadically mentioned in the EMR. These included notes on comorbidities, medications, surgical history, smoking status, and whether or not the patient was a recreational drug or alcohol user.

Discussion

In the Kingdom of Bahrain, the incidence of bladder cancer is 7.6% of all cancers (See Figure 1), and its associated mortality is 1.5% of all cancers (See Figure 2). It is the fourth leading cause of cancer death in Bahrain, and is preceded by lung (13.8%), colorectal (12.3%), and prostate (8.4%). The 5-year prevalence of bladder cancer in the Kingdom of Bahrain is 10.7% of all cancers in men and women (See Figure 3). In Bahraini males and females, the 5 most frequent cancers were breast, colorectal, lung, leukaemia, and bladder (World Health Organization, 2012).

Bladder cancer is the fourth commonest cancer in the US among men, and occurs thrice more often in males than females. The mean age of diagnosis is 65 years (CanadaQBank, 2016). 90% of all bladder cancers are transitional cell or urothelial carcinomas, and of these, the vast majority are papillary (i.e. non-invasive, superficial in nature, and easily resectable). The minority are squamous cell carcinomas, and are usually preceded by parasitic worm infection (i.e. specifically, S. haematobium), but other important risk factors include increasing age (American Cancer Society, 2016), cigarette smoking, and exposure to certain industrial chemicals (e.g. aromatic amines such as 2naphthylamine) and exhausts from the rubber and dye industries (Letašiová et al., 2012).

Common presenting symptomatology for patients with suspected bladder cancer include haematuria, dysuria, polyuria, pyuria, and pelvic pain (in advanced cases). Diagnosis is made via cystoscopy, where a camera attached to a cystoscope is inserted into the bladder, and a small biopsy specimen is taken for subsequent histopathological characterisation, grading, and staging. TURBT, or transurethral bladder resection of bladder tumors, occurs when a lesion is excised from within the bladder. Urine cytology may also be used forbye to detect malignant cells.

Based on a 10-year historical report (Al-Madouj et al., 2011) on cancer in the GCC countries between 1998 and 2007, 4212 total cancer cases were reported by nationality and gender for the Kingdom of Bahrain. During that time, there were more cancers reported in Bahraini females (51.8%) than males (48.2%). On the whole, the average incidence for all cancers in GCC countries increases with age; importantly, 9 in 10 persons with bladder cancer exceed age 55 at diagnosis (IACR, 2018). Moreover, of bladder cancers reported by Bahrain between 2003 and 2007, the majority of these diagnoses occurred in males (80.2%) than in females (19.8%). Crucially, of all the GCC countries, Bahrain had the highest rates of bladder cancer in both sexes (Al-Madouj et al., 2011).

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Finally, it was revealed that the diagnosis of bladder cancer in GCC states is confirmed most frequently on the basis of histopathology, and much less often via cytological and radiological means (Alsayyad & Hamadeh, 2014). Other confirmatory methods, including clinical, surgical, and cancer biomarkers, were very infrequently used.

Figure 1. Incidence of bladder cancer in Bahrain. Adapted from World Health Organization, Retrieved January 30, 2018, from http://globocan.iarc.fr/ Pages/fact_sheets_ population.aspx. Copyright 2018 by IARC.

Incidence of Bladder Cancer Among All New Cancer Diagnoses



Figure 2. 5-year prevalence of bladder cancer in Bahrain. Adapted from World Health Organization, Retrieved January 30, 2018, from http://globocan.iarc.fr/Pages/ fact_sheets_population.aspx. Copyright 2018 by IARC.

5-Year Prevalence of Bladder Cancer



Figure 3. Mortality of bladder cancer in Bahrain. Adapted from World Health Organization, Retrieved January 30, 2018, from http://globocan.iarc.fr/Pages/fact_ sheets _ population.aspx. Copyright 2018 by IARC.

Mortality of Bladder Cancer Among All Cancers



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Date	Report	Patient	Hospital	Age	Sex	Doctor	Ward/	Specimen	Dx	Demograp	hics
28-Sep-2014	3502	MH	37453	62	M	EM	Uro	A - Bladder (TURBT); B - Scrotal Tumor	A - Non-invasive papillary transitional cell carcinoma; B - well diff. liposarcoma/atypical lipomatous neoplasm	Age Range	22-87
16-Oct-2014	3699	BAA	32148	72	M	AD	Uro	Bladder (TURBT)	Non-invasive papillary transitional cell carcinoma, grade I, PT4 at least	Mean Age	64
19-Oct-2014	3723	MSA	118502	84	M	EM	Uro	Bladder (TURBT)	High grade papillary transitional cell carcinoma	Male	71
2-Nov-2014	3912	GMG	207665	45	М	EM	Uro	Bladder Bx	chronic cystitis	Female	9
13-Nov-2014	4037	MSA2	17353	67	Μ	AY	Uro	Bladder Tumor Bx	invasive transitional cell carcinoma (high grade), PT1		
20-Nov-2014	4165	MSA3	17353	67	M	AY		Bladder Tumor	invasive papillary transitional cell carcinoma, grade 3, PT1 at least		
23-Nov-2014	4184	JAD	867271	66	М	AD	Uro	Bladder	insufficient for		
10-Dec-2014	4452	EHH	730128	72	М	EM	Uro	Bladder Tumor	invasive high grade papillary transitional cell carcinoma, PT1		
7-Jan-2015	52	NAAA	98692	66	Μ	EM	Uro	A - Prostate (TURP); B - Bladder Tumor	A - benign prostatic hyperplasia; B- invasive papillary transitional cell carcinoma, high grade invading the superficial muscularis propria (PT2a)		
14-Jan-2015	164	EHH2	730128	72	M	AY	Sur	A - Lymph node; B - Bladder cuff; C - R kidney ureter			
21-Jan-2015	267	AMAM	8574	59	М	EM	Uro	Bladder	urothelial papillary		
19-Feb-2015	660	WAS	443333	54	M	SH	Uro	Bladder Tumor	mild chronic cystitis		
22-Feb-2015	694	BHM	113521	54	М	HE	Uro	Bladder Tumor	invasive transitional cell carcinoma grade 3 PT1 at least		
26-Feb-2015	788	BAMA	80718	47	M	КН	Uro	Bladder Tumor	invasive transitional cell carcinoma, grade 1. PT1		
12-Mar- 2015	977	MHJ	141789	70	M	AY	Sur	A - Bladder Tumor; B - Tumor bed resection	A - invasive high grade transitional cell carcinoma PT2		
15-Mar- 2015	1003	EMA	26673	57	M	EM	Uro	Bladder Tumor	invasive papillary transitional cell carcinoma, Grade 1, PT1		
2-Apr-2015	1304	NMHD	453504	27	М	AY	Uro	Bladder Bx	Ureteric papilloma		
5-Apr-2015	1325	KMAR	567110	73	F	EM	Uro	Bladder Tumor	invasive adenocarcinoma, PT1 at least		
20-Apr-2015	1569	NAA	98692	66	M	AD	Sur. Day	A - Bladder Tumor; B - Prostate Tumor	prostate and bladder Bxs; high grade invasive prostatic duct carcinoma		
17-May- 2015	1978	MJZ	155149	53	F	EM	Uro	Bladder (TURBT)	papillary urothelial neoplasm of low malig		

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30-May- 2015	2209	HSA	223923	/3	M	ΕM	Uro	Bladder (TURBT)	benign prostatic hyperplasia + separate grade 3 invasive papillary transitional cell	
									carcinoma of bladder PT1 at least	
4-Jun-2015	2291	NSA	185508	70	М	AD	Uro	Bladder tumor	low grade intraurothelial neoplasia	
18-Jun-2015	2528	RAF	23260	54	М	SH	Uro	A, B -	invasive papillary	
								Tumor	carcinoma (high	
									grade), invading the	
28-Jun-2015	2622	AME	161453	70	M	КН	Uro	A - Bladder	A - invasive papillary	
								(TURBT);	transitional cell	
								Prostate	moderately	
								(TURP)	diff/keratinising	
									carcinoma PTa at	
									least; B - benign prostatic	
10.1.1.0045	0764		700540	5.6		51.4			hyperplasia	
12-Jul-2015	2761	HEH	/08510	56	M	ΕM	Uro	Bladder (TURBT)	chronic active cystitis	
8-Aug-2015	3018	AMA	52965	57	Μ	AY	Uro	A - Bladder	A - papillary transitional cell	
								B - Rt	carcinoma, high	
								ureteric orifice	grade (no lamina propria & muscularis	
									layer in the submitted	
									specimen); B - no malignancy	
27 4	2412	4142	100226	66		<u>cu</u>	Com	Dia dalari	seen	
27-Aug- 2015	3412	AMAZ	100336	66		SH	Sur	Bladder Tumor	papillary transitional cell carcinoma grade 2 PTa	
30-Aug- 2015	3420	ARR	65960	56	М	RA	Uro	Bladder Bx	chronic cystitis	
2-Sep-2015	3504	ARAA	601347	62	М	RA	Uro	A - Bladder	benign prostatic	
								BX; B - TURP	nyperplasia	
16-Sep-2015	3726	AMA3	8574	60	М	RA	Uro	Bladder	papillary transitional	
									1 PTa	
4-Oct-2015	3897	HSA2	223923	74	M	RA	Uro	Bladder (TURBT)	transitional high	
								((invasive papillary)	
27-Oct-2015	4197	AME2	161453	71	M	EM	Uro	Bladder	invasive papillary	
								(TURBT)	transitional carcinoma	
									prostatic hyperplasia	
E Nov 2015	1265	DAFO	22260	FF	N.4		Uro	Pladdor	+ chronic prostatitis	
5-1007-2015	4305	KAFZ	23260	22		EIVI	Uro	Tumor		
29-Nov-2015	4731	КАК	16616	78	М	EM	Uro	Bladder (TURBT)	invasive papillary	
									carcinoma grade 2	
8-Dec-2015	4887	MAA	901176	68	M	RA	Day Case	Bladder	invasive transitional	
									grade w/ invasion	
									into the muscularis propria, PT2	
13-Dec-2015	4956	FJAA	777138	52	F	EM	Uro	Bladder	papillary transitional	
								(IUKRI)	ceil carcinoma, grade 2 w/ invasion into the	
27 4 2017	274		14044	0.4		T 11	1.1	Diad	lamina propria PT1	
27-Jan-2016	3/1	FAJ	14641	84	IVI	IU	Uro	Bladder Tumor	papillary transitional	
11 Eab 2010	619	D A F כ	12760	55	NA		Urc	Pladdor Dr.	cell carcinoma PTa	
23-Feb-2016	820	ZOD	2520U 857528	55 51	F	MO	Uro	Bladder BX	endometriosis	
	070	NAINA	FFC 402	60				Tumor		
25-reb-2016	870	IVIJIVI	556492	80	IVI	зн	uro	RIADDEL BX		

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6-Mar-2016	1013	MMAK	108169	79	М	EM	Uro	Bladder Bx	Masked acute on		
9-Mar-2016	1046	OME	9765	53	М	КН	Uro	Bladder (TURBT)	non-invasive papillary transitional cell		
									carcinoma, low grade Pta at least		
10-Mar- 2016	1096	YMJ	200967	75	M	MO	Uro	Bladder Tumor	low grade non- invasive papillary		
									transitional carcinoma + high grade		
									dysplasia polypoidal		
20-Mar-	1240	GAE	17586	71	М	EM	Uro	Bladder	acutely inflamed		
2016 27-Mar-	1353	EER	649842	86	M	MO	Uro	Bladder	invasive papillary		
2016								Tumor	transitional cell carcinoma grade 3, PT1		
18-Apr-2016	1744	SSE	60015	56	M	MA	Uro	Bladder Bx	cystitis cystica		
28-Apr-2016	1941	KDKB	733480	/5			Uro	A - Bladder Tumor; B - TURP	papillary transitional cell carcinoma of bladder w/ invasion to prostate		
12-May- 2016	2148	RJR	917673	53	M	MA	Uro	Bladder (TUR)	cystitis		
15-May- 2016	2169	AAS	64483	59	F	КН	Sur	Bladder Bx	polypoid cystitis		
22-May- 2016	2309	EA	152284	54	F	EM	Uro	A - Bladder	high grade invasive		
2010								B - deep B.	PT2a at least		
5-Jun-2016	2540	OM	9765	53	Μ	EM	Surg	Bladder	oedema w/ vascular		
23-Jun-2016	2766	YMJ2	200967	75	М	FA	Uro	Bladder	polypoidal cystitis		
28-Jun-2016	2823	AAA	696779	56	М	MA	Uro	A, B -	Grade 2 invasive		
								Bladder Tumor	cell carcinoma PT1 +		
2 101 2016	2062	VC	10707	72	N.4	ENA	Uro	Pladdor	non specific granuloma		
5-301-2010	2002	15	10/9/	75			010	(TURBT)	papillary transitional cell carcinoma PT1		
24-Jul-2016	3136	WHS	14702	57	F	MO	Uro	Bladder Bx	nested variant of urothelial carcinoma		
2-040-2016	2783	\\/US2	14702	57	E	тп	Sur	A - Bladdor	of the urinary bladder		
2-Aug-2010	5205	VVIIJZ	14702	57			Jui	(TURBT)	urothelial carcinoma		
								B - Deep resection	invasion & focal		
								of bladder tumors	urothelial dysplasia PT2a 'at least' chronic		
11-Aug-	3131	cc	25220	70	M	MA	Uro	Bladdor	cystitis		
2016	5454	22	55259	/0		IVIA	010	Tumor	carcinoma of the		
									bladder, intermediate grade/PT1b		
14-Aug- 2016	3464	JMA	125415	66	М	EM	Uro	Bladder (TURBT)	High grade urothelial carcinoma, stage PT2		
30-Aug-	3726	AM	93181	79	М	FA	Sur	Bladder	TCC, PT1, PNx, PMx		
19-Sep-2016	3955	BSB	168580	82	М	EM	Uro	A&B -	invasive grade 2		
								(TURBT)	cell ca - PT1b at least,		
									negative for malignancy		
22-Sep-2016	4014	NS	40167	60	М	FA	Surg	Bladder Bx	thickened deep		
	10.10	CNULA	24027	7-			Line	Diadad	malignancy		
25-Sep-2016	4048	SMHA	34037	/5		EM	Uro	Bladder (TURBT)	Invasive grade 3 transitional cell		
27-Sep-2016	4098	MHF	37453	64	M	RA	Uro	Bladder	carcinoma PT2a at least papillary transitional		
								Tumor	cell carcinoma, PTa at least		
29-Sep-2016	4126	SSH	71441	51	М	FA	Sur	Bladder	Mild inflammation;		
								turnor	malignancy		
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4-Oct-2016	4196	AMAM2	8574	61	Μ	FA	Uro	A - Bladdor By	invasive transitional	
								Bladder Bx B -	grade 1 PT1 at least	
								Bladder (TURBT)		
16-Oct-	4352	YSY	10797	74	Μ	EM	Uro	Bladder	Grade 2 papillary	
2016								(TURBT)	transitional cell carcinoma PT1 at	
									least	
23-Oct- 2016	4467	YHY	182536	44	M	EM	Uro	Bladder (TURBT)	low grade invasive urothelial neoplasm	
								(10101)	(TCC) PT1 at least	
27-Oct-	4541	SSM	35239	70	M	FA	Uro	Bladder	transitional papillary	
2010								Turnor	intermediate grade	
20. Oct	4572		120120	22	N/		Uro	Pladdor	PT1a (at least)	
2016	4373		139120	22			010	(TUR)	along w/ the	
									immunohistochemist rv is highly	
									suggestive of a	
									cystitis glandularis	
6-Nov-2016	4713	EEA	649842	87	М	EM	Uro	Bladder	Grade 2 invasive	
								(TUR)	papillary cell PTT at least	
10-Nov-	4774	FAGM	14641	85	М	FA	Uro	A -	Grade 2 invasive	
2016								Bladder Tumor	transitional cell carcinoma, PT1a,	
								B - Bladder By	chronic active cystitis	
13-Nov-	4830	HIS	130713	61	M	EM	Uro	Bladder	active phase of	
2016								(TURBT)	chronic follicular	
22-Nov-	5002	AMAM2	8574	61	M	FA	Surg	Bladder	Grade 2 - Invasive	
2016								Tumor	papillary transitional	
4-Dec-2016	5218	AAA2	696779	57	M	FA	Uro	Bladder	transitional cell	
								Tumor	carcinoma, grade 2,	
6-Dec-2016	5266	GFKH	23852	72	F	FA	Uro	A - R	A - polypoid cystitis	
								posterior Bladder Bx	B - mild chronic	
								B - L	C - benign	
								lateral wall	ulceration w/ chronic active cystitis	
								C - R		
								wall		
27-Dec-	5558	AAS	24012	60	М	MA	Sur	Bladder	High grade	
2016								(IUKBI)	w/ focal areas of	
									squamous metanlasia PT4	
5-Jan-2017	90	SSM2	35239	70	M	MU	Uro	Bladder	invasive grade 2/3	
								Tumor	papillary transitional	
									at least	
12-Jan- 2017	190	MAS	69393	73	М	MO	Uro	Bladder	non-invasive, grade	
2017									transitional cell	
									carcinoma, PTa at least	
17-Jan-	249	AEY	158398	53	Μ	FA	Uro	A -	Grade 2 invasive	
2017								Bladder Tumor	papillary transitional cell carcinoma - PT1	
								B - Deep	at least	
17-Jan-	254	OAA	733188	78	M	FA	Uro	Bladder	invasive grade 3.	
2017								Tumor	papillary transitional	
									cell carcinoma	

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Annex 2. Detailed history data sheet. Adapted from NICE, Retrieved August 2, 2017, from https://www.nice.org.uk/guidance/ng2/resources/clinical-audit-tool-excel-3604141. Copyright 2018 by NICE.

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