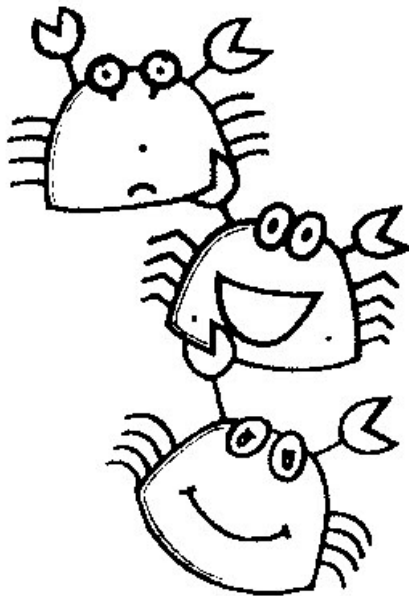


ANNUAL REPORT
ON
GYNECOLOGIC ONCOLOGY
2022



DIVISION OF GYNECOLOGIC ONCOLOGY
DEPARTMENT OF OBSTETRICS AND GYNECOLOGY
FACULTY OF MEDICINE, CHIANG MAI UNIVERSITY
CHIANG MAI, THAILAND

ANNUAL REPORT 2022

GYNECOLOGIC ONCOLOGY

DIVISION OF GYNECOLOGIC ONCOLOGY
DEPARTMENT OF OBSTETRICS AND GYNECOLOGY
FACULTY OF MEDICINE, CHIANG MAI UNIVERSITY
CHIANG MAI, THAILAND

WEBSITE: <http://www.med.cmu.ac.th/dept/obgyn/Unit/onco/oncofront.html>

GYNECOLOGIC ONCOLOGY STAFF 2022

Professor Jatupol Srisomboon, M.D.

Associate Professor Prapaporn Suprasert, M.D.

Associate Professor Kittipat Charoenkwan, M.D.

Assistant Professor Chailert Phongnarisorn, M.D.

Assistant Professor Chalong Cheewakriangkrai, M.D.

Assistant Professor Sitthicha Siriaree, M.D.

Associate Professor Charuwan Sae-Teng, M.D.

Assistant Professor Manatsawee Manopunya, M.D.

Sethawat Sethasathien, M.D.

Chalaithorn Nantasupha, M.D.

Dhammapoj Jeerakornpassawat, M.D.

Rattiya Phianpiset, M.D.

Sopida Fanchomphu, B.N.S.

Orathai Baisai, B.A.

Tanarat Muangmool, MSc.

รายงานประจำปี 2565

หน่วยมะเร็งวิทยานรีเวช

ภาควิชาสูติศาสตร์และนรีเวชวิทยา

คณะแพทยศาสตร์ มหาวิทยาลัยเชียงใหม่

อนุสาขามะเร็งวิทยานรีเวช

ศาสตราจารย์ นายแพทย์ จตุพล ศรีสมบูรณ์

รองศาสตราจารย์ แพทย์หญิง ประภาพร สู่ประเสริฐ

รองศาสตราจารย์ นายแพทย์ กิตติภัต เจริญขวัญ

ผู้ช่วยศาสตราจารย์ นายแพทย์ ฉลอง ชิวเกรียงไกร

ผู้ช่วยศาสตราจารย์ นายแพทย์ สิทธิชา สิริอารีย์

รองศาสตราจารย์ แพทย์หญิง จารุวรรณ แซ่เต็ง

ผู้ช่วยศาสตราจารย์ นายแพทย์ มนต์วิ มะโนปัญญา

อาจารย์ นายแพทย์ เศรษฐวัฒน์ เศรษฐเสถียร

อาจารย์ แพทย์หญิงชลัยธร นันทสุภา

อาจารย์ นายแพทย์ ธรรมพจน์ จิรากรภาสวัฒน์

อาจารย์ แพทย์หญิง รัชฎา เพียรพิเศษ

คุณโสภิตา ฝันชมภู

คุณอรทัย ไบโส

คุณธนรัฐ เมืองมูล

PREFACE

This updated 2022 version of the Gynecologic Oncology Annual Report summarizes our activities over the year. We managed 299 women diagnosed with gynecologic malignancies. Approximately half of these patients had cervical cancer while uterine cancer and ovarian cancer contributed almost equally to 44.80 % of all the cases. This information implies that carcinoma of the uterine cervix, uterine corpus, and ovary continue to play a dominant role when malignancies of the female genital tract are considered. This finding could be at least partly explained by the relative decrease in cervical cancer incidence resulting from more effective screening strategy with wider coverage and the relative increase in incidence of uterine and ovarian cancer due to the lifestyle change of this population.

This report is divided into two sections. The first section provides overview from the Gynecologic Cancer Registry of Chiang Mai University and detailed, organ-specific epidemiological data. The second section describes the infrastructure of our division and our academic contribution including international publications and abstract presentations.

I would like to express my sincere gratitude to Mrs. Sopida Fanchomphu and Mr. Tanarat Muangmool for their excellent work on gathering data for and editing this publication. Also, I am thankful to Mrs. Sopida Fanchomphu and Ms. Orathai Baisai for their hard work and great help on day-to-day data collection and database maintenance. In addition, I would like to hereby acknowledge the kind help and collaboration of our colleagues in Radiation Oncology, Gynecologic Pathology, Medical Oncology, Urology, Gastrointestinal/Colorectal Surgery, and Nursing departments. Furthermore, I deeply appreciate my Gynecologic Oncology colleagues and fellows for their perseverance and dedication. Without their determination, our mission would not be possible.

Associate Professor Kittipat Charoenkwan, MD, MSc
Chief, Division of Gynecologic Oncology
Acting Chairman, Department of Obstetrics and Gynecology
Faculty of Medicine, Chiang Mai University

CONTENT

Page

SECTION I

➤ Gynecologic Oncology Registry, Chiang Mai University: 2021	2
➤ Gynecologic Oncology Multiple Primary Cancer	5
➤ Operations and Procedures in Gynecologic Oncology	7
➤ Organ Specific Gynecologic Cancer	
Cancer of the Cervix	12
Cancer of the Ovary	18
Cancer of the Uterine Corpus	24
Cancer of the Vulva	31
Cancer of the Vagina	34
Cancer of the Fallopian Tube	36
Cancer of the Peritoneum	39
Gestational Trophoblastic Disease	41
Two primary	

SECTION II

➤ Medical Personnel and Facilities	44
➤ Diagnostic Procedure & Gynecologic Oncology Operations	45
➤ Publications & Presentations	46

SECTION I

- **Gynecologic Oncology Registry Chiang Mai University: 2022**
- **Gynecologic Oncology Multiple Primary Cancer**
- **Operations and Procedures in Gynecologic Oncology**
- **Organ Specific Gynecologic Cancer**
 - Cancer of the Cervix
 - Cancer of the Ovary
 - Cancer of the Uterine Corpus
 - Cancer of the Vulva
 - Cancer of the Vagina
 - Cancer of the Fallopian Tube
 - Cancer of the Peritoneum
 - Gestational Trophoblastic Disease
 - Cancer of Other Gynecologic Organs

TABLE 1: Gynecologic Oncology Registry: Chiang Mai University 1997-2022

Site	1997 Number (%)	1998 Number (%)	1999 Number (%)	2000 Number (%)	2001 Number (%)	2002 Number (%)	2003 Number (%)	2004 Number (%)	2005 Number (%)	2006 Number (%)
Cervix	547 (75.2)	483 (73.0)	497 (75.3)	502 (71.3)	500 (70.8)	521 (69.7)	624 (71.7)	532 (66.9)	525 (66.4)	488 (66.8)
Ovary	87 (12.0)	83 (12.5)	82 (12.4)	96 (13.6)	90 (12.7)	110 (14.7)	111 (12.8)	126 (15.9)	121 (15.3)	114 (15.6)
Corpus	48 (6.6)	47 (7.1)	49 (7.4)	56 (8.0)	63 (8.9)	61 (8.2)	67 (7.7)	89 (11.2)	97 (12.3)	84 (11.5)
Vulva	20 (2.8)	21 (3.2)	15 (2.2)	29 (4.1)	23 (3.3)	25 (3.3)	29 (3.3)	22 (2.8)	19 (2.4)	15 (2.0)
Vagina	11 (1.5)	10 (1.5)	3 (0.5)	2 (0.3)	9 (1.3)	6 (0.8)	12 (1.4)	5 (0.6)	4 (0.5)	5 (0.7)
FT	-	2 (0.3)	3 (0.5)	5 (0.7)	3 (0.4)	4 (0.5)	6 (0.7)	5 (0.6)	4 (0.5)	7 (1.0)
PPA	-	-	2 (0.3)	1 (0.1)	-	2 (0.3)	7 (0.8)	3 (0.4)	4 (0.5)	6 (0.8)
GTT	14 (1.9)	16 (2.4)	8 (1.2)	13 (1.9)	18 (2.6)	19 (2.5)	14 (1.6)	13 (1.6)	17 (2.1)	12 (1.6)
Total	727 (100)	662 (100)	660(659) (100)	704 (100)	706 (100)	748 (100)	870 (100)	795 (100)	791 (100)	731 (100)

PPA = Primary peritoneal adenocarcinoma

FT = Fallopian tube

GTT = Gestational trophoblastic tumors

TABLE 1: Gynecologic Oncology Registry: Chiang Mai University 1997-2021 (continued)

Site	2007 Number (%)	2008 Number (%)	2009 Number (%)	2010 Number (%)	2011 Number (%)	2012 Number (%)	2013 Number (%)	2014 Number (%)	2015 Number (%)	2016 Number (%)
Cervix	480 (63.6)	473 (62.3)	436 (58.1)	449(64.2)	387(57.2)	345 (57.9)	285 (54.8)	297 (58.4)	244 (52.6)	251 (52.5)
Ovary	132 (17.5)	115 (15.2)	141 (18.8)	105 (15.0)	118 (17.5)	86 (14.5)	85 (16.3)	87 (17.1)	85 (18.3)	69 (14.5)
Corpus	91 (12.0)	117 (15.4)	116 (15.5)	94 (13.5)	114 (16.9)	106 (17.8)	109 (21.0)	92 (18.1)	93 (20.0)	110 (23.0)
Vulva	11 (1.5)	21 (2.8)	24 (3.2)	21 (3.0)	16 (2.4)	27 (4.5)	24 (4.6)	11 (2.2)	15 (3.2)	22 (4.6)
Vagina	6 (0.7)	7 (0.9)	7 (0.9)	12 (1.7)	11 (1.6)	5 (0.8)	2 (0.4)	2 (0.4)	2 (0.4)	3 (0.6)
FT	7 (0.9)	4 (0.5)	4 (0.5)	6 (0.9)	3 (0.4)	4 (0.7)	3 (0.6)	7 (1.4)	11 (2.4)	11 (2.3)
PPA	11 (1.5)	7 (0.9)	8 (1.1)	-	5 (0.7)	8 (1.3)	4 (0.8)	6 (1.2)	4 (0.9)	4 (0.8)
GTT	17 (2.3)	15 (2.0)	14 (1.9)	12 (1.7)	22 (3.3)	15 (2.5)	8 (1.5)	7 (1.4)	10 (2.2)	8 (1.7)
Total	755 (100)	759 (100)	750 (100)	699 (100)	676 (100)	596 (100)	520 (100)	509 (100)	464 (100)	478 (100)

PPA = Primary peritoneal adenocarcinoma

FT = Fallopian tube

GTT = Gestational trophoblastic tumors

TABLE 1: Gynecologic Oncology Registry: Chiang Mai University 1997-2021 (continued)

Site	2017 Number (%)	2018 Number (%)	2019 Number (%)	2020 Number (%)	2021 Number (%)	2022 Number (%)
Cervix	256 (51.2)	213 (51.9)	224 (51.3)	228 (54.5)	119 (44.2)	128 (42.8)
Ovary	90 (18.0)	71 (17.3)	66 (15.1)	67 (16.0)	49 (18.2)	44 (14.7)
Corpus	102 (20.4)	88 (21.4)	112 (25.6)	81 (19.4)	74 (27.5)	90 (30.1)
Vulva	20 (4.0)	19 (4.6)	13 (3.0)	15 (3.6)	4 (1.5)	10 (3.3)
Vagina	5 (1.0)	1 (0.2)	3 (0.7)	5 (1.2)	3 (1.1)	5 (1.7)
FT	9 (1.8)	14 (3.4)	9 (2.1)	11 (2.6)	11 (4.1)	8 (2.7)
PPA	2 (0.4)	2 (0.5)	1 (0.2)	2 (0.5)	4 (1.5)	8 (2.7)
GTT	16 (3.2)	2 (0.5)	7 (1.6)	9 (2.2)	5 (1.9)	5 (1.7)
Others	-	1 (0.2)	2 (0.4)	-	-	1 (0.3)
Total	500 (100)	411 (100)	437 (100)	418 (100)	269 (100)	299 (100)

PPA = Primary peritoneal adenocarcinoma FT = Fallopian tube GTT = Gestational trophoblastic tumors other =Two primary (Ovary & Corpus)

Gynecologic Oncology Multiple Primary Cancers: Chiang Mai University 2002-2022

[illegible]

Gynecologic Oncology Multiple Primary Cancers: Chiang Mai University 2002-2021

[illegible]

Operations and Procedures in Gynecologic Oncology

Operations and procedures	1997 Number	1998 Number	1999 Number	2000 Number	2001 Number	2002 Number	2003 Number	2004 Number	2005 Number	2006 Number
Surgery for ovarian & tubal cancer	64	43	64	70	45	69	88	79	80	111
Surgery for corpus cancer	33	28	26	36	43	39	47	60	75	53
Surgery for vulvar cancer	10	14	5	19	12	14	21	19	14	12
Radical hysterectomy*	55	77	113	120	116	135	150	151	149	143
Laparoscopic radical hysterectomy*	-	-	-	-	-	-	-	4	18	21
Radical parametrectomy*	2	2	1	1	1	3	4	1	1	2
Laparoscopic radical parametrectomy*	-	-	-	-	-	-	-	1	1	3
Extrafascial hysterectomy	118	110	155	182	121	89	43	35	52	55
Total laparoscopic hysterectomy		-	-	-	-	-	10	11	9	4
CKC	66	65	79	13	14	22	16	9	10	5
LEEP	61	35	166	207	194	221	380	276	261	309
Cryosurgery	20	15	18	8	4	3	1	-	2	-
Colposcopy	227	235	463	371	369	306	357	399	499	627

* with pelvic lymphadenectomy

CKC = Cold knife conization

LEEP = Loop electrosurgical excision procedure

Operations and Procedures in Gynecologic Oncology (continued)

Operations and procedures	2007 Number	2008 Number	2009 Number	2010 Number	2011 Number	2012 Number	2013 Number	2014 Number	2015 Number	2016 Number
Surgery for ovarian & tubal Cancer	89	95	115	87	117	103	88	92	105	82
Surgery for corpus cancer	80	106	83	87	96	94	100	81	72	110
Surgery for vulvar cancer	8	21	18	20	14	17	20	28	15	28
Radical hysterectomy*	120	121	103	125	89	71	58	57	55	58
Modified radical hysterectomy*	-	-	18	12	17	12	7	10	9	6
Abandoned hysterectomy*	-	-	1	1	3	7	2	2	2	2
Radical parametrectomy*	1	-	1	-	2	2	-	2	1	1
Laparoscopic surgical staging for corpus cancer	-	-	-	6	4	3	2	5	4	4
Laparoscopic radical hysterectomy*	11	16	5	-	9	9	8	3	3	8
Laparoscopic radical trachelectomy*	-	-	-	-	-	-	-	2	-	-
Laparoscopic radical parametrectomy*	-	-	-	2	-	-	-	-	-	-
Total laparoscopic hysterectomy	4	2	2	2	2	1	1	3	-	-
Robotic radical hysterectomy*	-	-	-	-	-	-	2	1	-	-
CKC	15	6	5	6	2	-	1	-	-	-
LEEP	317	235	175	203	157	173	239	144	215	160
Colposcopy	519	556	474	409	406	494	728	659	775	600

* with pelvic lymphadenectomy

CKC = Cold knife conization

LEEP = Loop electrosurgical excision procedure

Operations and Procedures in Gynecologic Oncology (continued)

Operations and Procedures	2017 Number	2018 Number	2019 Number	2020 Number	2021 Number	2022 Number
Surgery for ovarian & tubal cancer	90	88	69	88	58	55
Surgery for corpus cancer	98	87	87	87	68	84
Surgery for vulvar & vagina cancer	17	22	22	22	3	9
Radical hysterectomy*	74	56	56	56	25	19
Modified radical hysterectomy*	4	4	4	4	1	2
Abandoned hysterectomy*	-	-	-	-	1	1
Radical parametrectomy*	2	-	-	-	-	-
Radical Trachelectomy	-	-	-	-	-	2
Laparoscopic radical hysterectomy*	3	3	3	3	1	-
NOTES assisted vaginal hysterectomy	2	2	2	2	-	-
NOTES assisted extrafascial hysterectomy	1	-	-	-	-	-
Laparoscopic radical parametrectomy*	-	-	-	-	-	-
Total laparoscopic hysterectomy	1	2	2	2	5	3
CKC	-	-	-	-	-	-
LEEP	116	89	115	87	60	75
Colposcopy	537	463	470	627	389	654

* with pelvic lymphadenectomy

CKC = Cold knife conization

LEEP = Loop electrosurgical excision procedure

NOTES = Natural orifice transluminal endoscopic surgery

Cancer of the Cervix

➤ Distribution by

- Age
- Parity
- Stage and Substage
- HIV Status
- Histological Type
- Treatment

TABLE 2: Cancer of the Cervix: Age Distribution

Age	Number	Percent
≤30	5	3.9
31-40	20	15.6
41-50	30	23.4
51-60	36	28.1
61-70	25	19.5
71-80	10	7.8
> 81	2	1.6
Total	128	100

Minimum age 27.0 years, Maximum age 85.0 years

Mean age 52.70 ± 13.08 years

TABLE 3: Cancer of the Cervix: Parity Distribution

Parity	Number	Percent
0	17	13.5
1	33	26.2
2	44	34.9
3	19	15.1
4	7	5.6
5	4	3.2
6	2	1.6
7	1	0.8
unknow	1	0.8
Total	128	100

TABLE 4: Cancer of the Cervix: Stage Distribution

Stage	Number	Percent
I	40	31.3
II	26	20.3
III	39	30.5
IV	11	8.6
Recurrent	4	3.1
HSIL	8	6.3
Total	128	100

TABLE 5: Cancer of the Cervix: Stage and Substage Distribution

	<i>Stage</i>	Number	Percent
I	IA	3	2.3
	IA1	9	7.0
	IA2	1	0.8
	IB	1	0.8
	IB1	7	5.5
	IB2	11	8.6
	IB3	8	6.3
II	IIA	-	
	IIA1	1	0.8
	IIA2	1	0.8
	IIB	25	19.5
III	IIIA2	1	0.8
	IIIB	15	11.7
	IIIC	-	-
	IIIC1	18	14.1
	IIIC2	5	3.9
IV	IVA	2	1.6
	IVB	9	7.0
Recurrent		4	3.1
HSIL		7	5.5
Total		128	100

HSIL = High-grade squamous intraepithelial lesion

TABLE 6: HIV Status in Cervical Cancer Patients dividing by Stage

Stage	Number Negative HIV (%)	Number Positive HIV (%)	Number not done (%)	Total (%)
IA	2 (2.0)	1 (10.0)	-	3 (2.3)
IA1	8 (8.2)	1 (10.0)	-	9 (7.0)
IA2	1 (1.0)	-	-	1 (0.8)
IB	1 (1.0)	-	-	1 (0.8)
IB1	6 (6.1)	-	1 (5.0)	7 (5.5)
IB2	11 (11.2)	-	-	11 (8.6)
IB3	7 (7.1)	1 (10.0)	-	8 (6.3)
IIA	-	-	-	-
IIA1	-	-	1 (5.0)	1 (0.8)
IIA2	1 (1.0)	-	-	1 (0.8)
IIB	18 (18.4)	4 (40.0)	3 (15.0)	25 (19.5)
IIIA2	1 (1.0)	-	-	1 (0.8)
IIIB	13 (13.3)	-	2 (10.0)	15 (11.7)
IIIC	-	-	-	-
IIIC1	13 (13.3)	1 (10.0)	4 (20.0)	18 (14.1)
IIIC2	3 (3.1)	2 (20.0)	-	5 (3.9)
IVA	2 (2.0)	-	-	2 (1.6)
IVB	5 (5.1)	-	4 (20.0)	9 (7.0)
Recurrent	2 (2.0)	-	2 (10.0)	4 (3.1)
HSIL	4 (4.1)	-	3 (15.0)	7 (5.5)
Total	98	10	20	128 (100)

HIV = Human immunodeficiency virus

HSIL = High-grade squamous intraepithelial lesion

TABLE 7: Cancer of the Cervix: Distribution by Histological Type

Histological Type	Number	Percent
Squamous cell carcinoma	90	70.3
Well differentiated	1	1.1
Moderately differentiated	50	55.6
Poorly differentiated	29	32.2
No defined differentiation	10	11.1
Adenocarcinoma	26	20.3
Adenosquamous	1	0.8
Small cell NE	1	0.8
HSIL	8	6.3
Malignant melanoma	1	0.8
Unknow	1	0.8
Total	128	100

NE = Neuroendocrine

CA = Carcinoma

HSIL = High-grade squamous intraepithelial lesion

TABLE 8: Treatment of Cancer of the Cervix

Treatment	Number	Percent
Surgery alone	27	21.1
Modified Radical hysterectomy	2	1.6
TAH	6	4.7
RHPL	15	11.7
Radical Trachelectomy	2	1.6
Laparoscopic hysterectomy	2	1.6
Chemotherapy alone	9	7.0
CCRT	31	24.2
RT alone	1	0.8
Brachytherapy	2	1.6
Combined treatment	19	14.8
BPL+CCRT	3	2.3
Abandon hysterectomy + CCRT	1	0.8
TAH + brachytherapy	1	0.8
RHPL + CCRT	8	6.3
RHPL + CMT	1	0.8
RHPL + RT	2	1.6
Radical Trachelectomy + RT	1	0.8
Laparoscopic hysterectomy+EBRT+HDR	2	1.6
Others	39	30.5
Follow-up	29	22.7
Denied treatment	-	-
Refer to other hospital for treatment	2	1.6
Loss FU	6	4.7
Palliative care	2	1.6
Total	128	100

TAH = Total abdominal hysterectomy

RHPL = Radical hysterectomy with bilateral pelvic
lymphadenectomy

RT = Radiation therapy

CCRT = Concurrent chemoradiation

CMT = Chemotherapy

BPL = Bilateral pelvic lymphadenectomy

HDR = High dose-rate brachytherapy

Cancer of the Ovary

➤ **Distribution by**

- Age
- Parity
- Histology
- Histology Subtype
 - Epithelial Group
 - Germ Cell Tumor Group
 - Sex cord-stromal Group
 - Other Groups
- Stage
 - Epithelial Group
 - Germ Cell Group
 - Sex cord-stromal Group
 - Other Groups
- Stage and Histology
- Treatment

TABLE 9: Cancer of the Ovary: Age Distribution

Age	Number	Percent
≤20	4	9.1
21-30	4	9.1
31-40	6	13.6
41-50	9	20.5
51-60	12	27.3
61-70	8	18.2
71-80	1	2.3
Total	44	100

Minimum age 11.0 years, Maximum age 71.0 years

Mean age 48.7 ± 16.0 years

TABLE 10: Cancer of the Ovary: Parity Distribution

Parity	Number	Percent
0	21	47.7
1	8	18.2
2	13	29.5
3	1	2.3
unknow	1	2.3
Total	44	100

TABLE 11: Cancer of the Ovary: Histological Distribution

Histology	Number	Percent
Epithelium	38	86.4
Germ cell	5	11.4
Sex cord	1	2.3
Total	44	100

TABLE 12: Epithelial Ovarian Cancer: Histological Subtype Distribution

Histological Subtype	Number	Percent
Serous adeno CA	10	26.3
Serous LMP	1	2.6
Clear cell CA	8	21.1
Endometrioid CA	2	5.3
Mucinous LMP	7	18.4
Adeno CA	2	5.3
Adenosarcoma	1	2.6
Mixed HGSA+Endometrioid adeno CA	3	7.9
Squamous cell CA	1	2.6
Mixed Endometrioid+serous clear cell	2	5.3
malignant melanoma	1	2.6
Total	38	100

CA = Carcinoma

LMP = Low malignant potential

SCCA = Squamous cell carcinoma

TABLE 13: Ovarian Germ Cell Tumor (GCT): Histological Subtype Distribution

Histological Subtype	Number	Percent
Immature teratoma	2	40.0
Dysgerminoma	2	40.0
Yolk sac tumor	1	20.0
Total	5	100

TABLE 14: Sex cord-stromal tumor: Histological Subtype Distribution

Subtype	Number	Percent
Juvenile granulosa cell	1	100
Total	1	100

TABLE 15: Epithelial Ovarian Cancer: Stage Distribution

Stage	Number	Percent
IA	3	7.9
IC	3	7.9
IC1	1	2.6
IC2	5	13.2
IC3	2	5.3
II	1	2.6
IIA	1	2.6
IIB	1	2.6
III	1	2.6
IIIB	2	5.3
IIIA2	1	2.6
IIIC	4	10.5
IV	1	2.6
IVB	2	5.3
Recurrent	1	2.6
Advanced stage	5	13.2
Not staged	4	10.5
Total	38	100

TABLE 16: Germ Cell Ovarian Cancer: Stage Distribution

Stage	Number	Percent
IA	1	20.0
IC2	1	20.0
IC3	1	20.0
IIIA2	1	20.0
IIIC2	1	20.0
Total	5	100

TABLE 17: Sex cord-stromal tumor: Stage

Stage	Number	Percent
IC3	1	100
Total	1	100

TABLE 16: Ovarian Cancer: Stage and Histology Distribution

Stage	Epithelial	Percent	Germ cell	Percent	Sex cord	Percent
IA	3	8.8	1	20.0	-	-
IC	3	8.8	-	-	-	-
IC1	1	2.9	-	-	-	-
IC2	5	14.7	1	20.0		
IC3	2	5.9	1	20.0	1	100
II	1	2.9	-	-	-	-
IIA	1	2.9	-	-	-	-
IIB	1	2.9	-	-	-	-
III	1	2.9	-	-	-	-
IIIA2	1	2.9	1	20.0	-	-
IIIB	2	5.9				
IIIC	4	11.8	-	-	-	-
IIIC2	-	-	1	20.0	-	-
IV	1	2.9	-	-	-	-
IVB	2	5.9	-	-	-	-
Recurrent	1	2.9	-	-	-	-
Advanced stage	5	14.7	-	-	-	-
Not staged	4	11.8	-	-	-	-
Total	38	100	5	100	1	100

TABLE 17: Cancer of the Ovary: Primary Treatment and Adjuvant Chemotherapy

Treatment	Number	Percent
Complete SSP with adjuvant chemotherapy	9	20.5
Complete SSP without adjuvant chemotherapy	1	2.3
Incomplete SSP with adjuvant chemotherapy	22	50.0
Incomplete SSP without adjuvant chemotherapy	7	15.9
NAC + Incomplete SSP with adjuvant chemotherapy	5	11.4
Total	44	100

SSP = Surgical staging procedure

NAC = Neoadjuvant chemotherapy

TABLE 18: Ovarian Cancer: Outcome of Treatment

Outcome	Number	Percent
Under follow-up without disease	18	40.9
Under follow-up with disease	1	2.3
During treatment	12	27.3
Lost to follow-up	4	9.1
Refer to provincial hospital for treatment	8	18.2
Dead	1	2.3
Total	44	100

Cancer of the Uterine Corpus

➤ **Distribution by**

- Age
- Menopausal Status
- Underlying Medical Diseases
- Parity
- Clinical Staging
- Surgical Staging
- Histology
- Treatment

TABLE 19: Cancer of the Corpus: Age Distribution

Age	Number	Percent
≤40	2	2.2
41-50	10	11.1
51-60	30	33.3
61-70	36	40.0
71-80	10	11.1
81-90	2	2.2
Total	90	100

Minimum age 36.0 years, Maximum age 88.0 years

Mean age 61.3 ± 9.8 years

TABLE 20: Cancer of the Corpus: Distribution by Menopausal Status

Menopausal Status	Number	Percent
Yes	75	83.3
No	15	16.7
Total	90	100

TABLE 21: Cancer of the Uterine Corpus: Distribution by Underlying Diseases

Medical disease	Number	Percent
None	17	30.9
Allergic rhinitis	1	1.8
AF	1	1.8
HT with DM with CKD	1	1.8
CA breast with DM	1	1.8
HT	13	23.6
HT with allergic rhinitis	1	1.8
HT with Thyrotoxicosis	1	1.8
HT with DLP with Thyrotoxicosis	1	1.8
HT with DLP with IFG	1	1.8
HT with DLP with OSA	1	1.8
HT with hypothyroidism,DLP, Asymptomatic GS	1	1.8
HT with CA breast	1	1.8
HT with DM	3	5.5
HT with DLP	9	16.4
HT with DM with DLP,CA breast	1	1.8
HT with DM with DLP,Hypericemia	1	1.8
HT with DM with goiter	1	1.8
HT with DM with TVD	1	1.8
HT with DM with OSA,obesity,HBV infection	1	1.8
DM with DLP	7	12.7
Hx:CA breast	1	1.8
Hx:CA colon	1	1.8
Hx:CA rectum	1	1.8
Hx:CA thyroid	1	1.8
Depression,dyspepsia	1	1.8
DLP	7	12.7
DLP and psychy	1	1.8
DLP,old CVA	1	1.8
DVT	1	1.8
GERD	1	1.8
Heart: old CVA	1	1.8
HIV+ve and pyschy	1	1.8
Migraine	1	1.8
old SCI c paralysis,NLUTD,Trigeminal neuralgia	1	1.8
panic diaorder	1	1.8
peptic ulcer	1	1.8
thalassemia	1	1.8
Thyrotoxicosis	1	1.8
zchizophrenia	1	1.8
Total	90	100

AF = Atrial fibrillation
 AR = Aortic Regurgitation
 CA = Cancer
 CKD = Chronic kidney disease
 CVA = Cerebrovascular accident
 DLP = Dyslipidemia
 DM = Diabetes mellitus
 DVT = Deep vein thrombosis
 RHD = Rheumatic heart disease

TABLE 22: Cancer of the Uterine Corpus: Distribution by Parity

Parity	Number	Percent
0	24	26.7
1	16	17.8
2	32	35.6
3	12	13.3
4	4	4.4
5	1	1.1
unknown	1	1.1
Total	90	100

TABLE 23: Cancer of the Uterine Corpus: Distribution by Surgical Staging

	Stage	Number	Percent
I	IA	28	31.1
	IB	21	23.3
	IC	1	1.1
II	II	7	7.8
	IIB	1	1.1
III	IIIA	9	10.0
	IIIB	3	3.3
	IIIC1	7	7.8
	IIIC2	3	3.3
IV	IVA	2	2.2
	IVB	5	5.6
Recurrent		1	1.1
Unstaged		2	2.2
Total		90	100

TABLE 24: Cancer of the Uterine Corpus: Histologic Distribution

Histology Type	Number	Percent
Endometrioid adeno CA	54	60.0
Grade I	23	25.6
Grade II	20	22.2
Grade III	11	12.2
High-grade Serous adenoCA	12	13.3
High-grade adenoCA	1	1.1
Mixed type	7	7.8
Clear cell adenoCA	2	2.2
Leiomyosarcoma	1	1.1
Adenocarcinoma	3	3.3
Adenosarcoma	3	3.3
Carcinosarcoma	6	6.7
SCCA	1	1.1
Total	90	100

CA = Carcinoma

ESS = Endodermal stromal sarcoma

TABLE 25: Treatment of Corpus Cancer

Treatment	Number	Percent
Complete SSP	14	15.6
Complete SSP +Adj. Chemotherapy	13	14.4
Complete SSP +RT	2	2.2
Complete SSP+CCRT	1	1.1
Complete SSP + Radiation therapy + Brachytherapy	9	10.0
Complete SSP + Brachytherapy	8	8.9
Complete SSP + Sequential CMT-RT	16	17.8
Incomplete SSP	3	3.3
NAC:CMT+Incomplete SSP +Adj.CMT	1	1.1
Incomplete SSP + Adj.Chemotherapy	7	7.8
Incomplete SSP +sequential CMT-RT	10	11.1
Incomplete SSP + RT + Brachytherapy	2	2.2
Incomplete SSP + Brachytherapy	2	2.2
Incomplete SSP +CCRT	2	2.2
Total	90	100

Adj = Adjuvant

NAC = Neoadjuvant chemotherapy

CMT = Chemotherapy

SSP = Surgical staging procedure

WPRT = Whole pelvis radiotherapy

EBRT = External beam radiotherapy

CCRT = Concurrent chemoradiation

RT = Radiation therapy

VBT = Vaginal Brachytherapy

TABLE 26: Outcome of Treatment of Corpus Cancer

Outcome	Number	Percent
Under follow-up without disease	47	52.2
During treatment	19	21.1
During treatment with progression/persistence of disease	3	3.3
During treatment with partial response	1	1.1
During treatment with disease	1	1.1
Refer to other hospital for treatment	6	6.7
Loss to follow-up	12	13.3
Dead	1	1.1
Total	90	100

Cancer of the Vulva

➤ Distribution by

- Age
- Stage
- Histology
- Treatment

TABLE 27: Cancer of the Vulva: Age Distribution

Age	Number	Percent
31-40	1	11.1
41-50	1	11.1
51-60	3	33.3
61-70	3	33.3
71-80	1	11.1
Total	9	100

Minimum age 34.0 years, Maximum age 71.0 years

Mean age 56.7 ± 10.6 years

TABLE 28: Cancer of the Vulva: Stage Distribution

Stage	Number	Percent
Paget disease	1	11.1
malignant melanoma	1	11.1
IA	2	22.2
IA1	2	22.2
IB	1	11.1
II	1	11.1
Advanced	1	11.1
Total	9	100

TABLE 29: Cancer of the Vulva: Histological Type Distribution

Histological Type distribution	Number	Percent
Squamous cell carcinoma	4	44.4
Well differentiated	3	33.3
Moderate differentiated	1	11.1
HSIL	2	22.2
Paget disease	1	11.1
malignant melanoma	1	11.1
Angiosarcoma	1	11.1
Total	9	100

HSIL = High-grade squamous intraepithelial lesion

TABLE 30: Treatment of Cancer of the Vulva

Treatment	Number	Percent
BGND+RT	2	22.2
Radical local excision	2	22.2
Radical vulvectomy	2	22.2
WLE	2	22.2
Brachytherapy	1	11.1
Total	9	100

RT = Radiation

BGND = Bilateral groin node dissection

Cancer of the Vagina

➤ Distribution by

- Age
- Stage
- Histology
- Treatment

TABLE 31: Cancer of the Vagina

No	Age	Stage	Histology	Treatment	Outcome
1	69	I	Adeno CA	CCRT	During Treatment
2	71	Not stage	SCCA	CCRT + VBT	Good, under follow-up without disesae
3	72	II	SCCA,MD	WPRT+VBT	Loss follow-up
4	60	IVA	SCCA,MD	Plan CCRT(Pt.loss FU)	Loss follow-up
5	78	II	Adeno CA	WPRT+VBT	Palliative care

CA = Carcinoma

CCRT = Concurrent chemoradiation

SCCA = Squamous cell carcinoma

WPRT = Whole pelvis radiotherapy

VBT = Vaginal brachytherapy

Cancer of the Fallopian Tube

TABLE 32: Cancer of the Fallopian Tube 2022

Data	Case 1	Case 2	Case 3
Age	41	65	71
Marital status	Single	Married	single
Parity	0-0-0-0	0-0-0-0	0-0-0-0
Presenting symptoms	Pelvic mass		Pelvic mass + post menopausal bleeding
Stage	IIIC1	IIIC	IIB
Histology	High grade serous adenoCA	High grade serous adenoCA	High grade serous adenoCA
Treatment	PTx6 +BEV x1 → Loss follow up	NAC:PT x4→TAH with BSO with lysis adhesion with omental Bx with Rt.CIN Excision with →Adj.PT x2+Bev x7→ PD→ Caboplati+lipodox→ SD→ Gemcitabine x1→ Oral Eto →Refer to other hospital	TAHwith BSO with BPNS with PANS with peritoneal washing with appendectomy →adjuvant PT + Bev
Outcome	Loss follow up	Refer to other hospital	During treatment

Data	Case 4	Case 5	Case 6
Age	43	54	59
Marital status	Married	Married	Married
Parity	1-0-0-1	1-0-0-1	1-0-0-1
Presenting symptoms	Pelvic pain	Pelvic pain	Abdominal distension
Stage	IIIB	IIIC	IIIA
Histology	High grade serous adenoCA	High grade serous adenoCA	High grade serous adenoCA
Treatment	Subtotal hysterectomy with BSO with partial omentectomy with appendectomy with lysis adhesion→ adjuvant PT+BEV	TAHwith BSO with partial omentectomy with debulking tumor with ascites collection → adjuvant PT	TAHwith BSO with lysis adhesion with Lt.PAND with ascites collection→ Adjuvant PT
Outcome	During treatment	Good, under follow-up with regression of disease	Good under follow up without disease

Data	Case 7
Age	70
Marital status	Married
Parity	2002
Presenting symptoms	Pelvic mass
Stage	IIIC
Histology	HGSA
Treatment	TAHwith BSO with partial omentectomy with debulking tumor →Adj.PT+Bev
Outcome	During treatment

BPND	= Bilateral pelvic node dissection
BPNS	= Bilateral pelvic node sampling
BSO	= Bilateral salpingo-oophorectomy
CA	= Carcinoma
Lt	= Left
LN	= Lymnode
NAC	= Neoadjuvant chemotherapy
PAND	= Para-aortic node dissection
PND	= pelvic node dissection
PT	= Paclitaxel and Carboplatin
PD	= Progressive disease
Rt	= Right
SO	= Salpingo-oophorectomy
TAH	= Total abdominal hysterectomy

Cancer of the Peritoneum

TABLE 33: Cancer of the Peritoneum 2022

Data	Case 1	Case 2
Age	62	26
Marital status	Married	Married
Parity	unknow	0-0-0-0
Presenting symptoms	Pelvic pain	Pelvic mass
Stage	IIIC	IIIA2
Histology	High grade serous adeno CA	mesothelioma (epithelioid-type) of peritoneum
Treatment	NAC:PT→TAH with BSO with omentectomy with Appendectomy → Adjuvant PT→WBRT→lipodox	TAH with Rt. SO with tumor debulking with HIPEC→Surveillance
Outcome	Loss fallow up	Under FU without disease

Data	Case 3	Case 4
Age	30	43
Marital status	Married	Single
Parity	0-0-0-0	0-0-0-0
Presenting symptoms	Pelvic pain	Abdominal distension
Stage	Not stage	Advanced
Histology	Clear cell Adeno CA	High grade serous adeno CA
Treatment	enbloc-resection peritoneal tumor → Adjuvant PT	NAC:PT→Laparoscopic resection of tumor → Adjuvant PT
Outcome	During treatment	During treatment

Data	Case 5	Case 6
Age	64	68
Marital status	Married	Married
Parity	2-0-0-2	2-0-0-2
Presenting symptoms	Pelvic pain with Abdominal distension	Pelvic mass
Stage	IIIA1	IIIC
Histology	Adeno CA	High grade serous adeno CA
Treatment	TAH with BSO with Omentectomy with lysis adhesion → Adjuvant PT	BSO with Omental Bx→PT→TAH→Gemcitabine→PT→Oral Eto→loss fallow up
Outcome	During treatment	Loss fallow up

Data	Case 7	Case 8
Age	69	70
Marital status	Married	Married
Parity	2-0-0-2	3-0-1-3
Presenting symptoms	Abdominal pain	Abdominal distension
Stage	IVB	IIIC
Histology	High grade serous adeno CA	High grade serous adeno CA
Treatment	NAC:PT→TAH with BSO with omentectomy with lysis adhesion→Adj.PT	NAC:PT→TAH with BSO with omentectomy with lysis adhesion→Adj.PT+Bev
Outcome	During treatment	During treatment

Data	Case 9
Age	58
Marital status	Single
Parity	0-0-0-0
Presenting symptoms	Abdominal distension
Stage	Advanced
Histology	High grade serous adeno CA
Treatment	NAC:PT→TAH with BSO with tumor debulking with omentectomy→Adj.PT+Bev
Outcome	During treatment

CA = Carcinoma
 TAH = Total abdominal hysterectomy
 BSO = Bilateral salpingo-oophorectomy
 PT = Paclitaxel and Carboplatin
 NAC = Neoadjuvant chemotherapy
 SO = Salpingo-oophorectomy
 BEV = Bevacizumab

Gestational Trophoblastic Disease

- Gestational Trophoblastic Tumor

TABLE 34: Gestational Trophoblastic Tumors in 2022

No	Age (year)	Initial hCG titer	Prognosis Classification	Diagnosis	FIGO	Treatment	Result
1	47	327718	NMGTT, Poor prognosis	GTN	I	MTX -FA→ Actinomycin D	During treatment
2	35	244	NMGTT, Good prognosis	GTN	IV	TAH with peritoneal washing with omentectomy→EMA/EP	Good→Follow-up β-HCG
3	32	177483	NMGTT, Good prognosis,	GTN	I	EMA-CO	Good→Follow-up β-HCG
4	29	7613	MGTT Poor prognosis	GTN	III	TAH with Rt.SO with Lt.salpingectomy→EMA-CO	During treatment
5	27	401764	NMGTT Good prognosis	GTN	I	MTX-FA	Good→Follow-up β-HCG

EMA-CO = Etoposide + Methotrexate + Actinomycin D + Cyclophosphamide + Vincristine

GTN = Gestational trophoblastic tumor

HCG = Human chorionic gonadotropin

MGTT = Metastatic gestational trophoblastic tumor

MTX = Methotrexate

MTX-FA = Methotrexate + Folinic acid

NMGTT = Non-metastatic gestational trophoblastic tumor

Cancer of Two Primary Gynecologic Organs

TABLE 35 : Cancer of the Two Primary Gynecologic Organs 2022

Data	Case 1 CA Corpus +CA Ovary
HN	4148263
Age	47
Marital status	Married
Parity	0-0-0-0
Presenting symptoms	Pelvic mass
Stage	Corpus: IB Ovary: IC1
Histology	Corpus: Endometrioid adenoCA grade 1 Ovary: Endometrioid adeno CA grade 1
Treatment	TAH ¯ BSO ¯ Rt.pelvic LN dissection ¯ paraaortic Ln dissection ¯ omentectomy ¯ ascites collection→ sequentailCMT-RT
Outcome	During treatment

CA = carcinoma
 CMT = Chemotherapy
 RT = Radio therapy
 TAH&BSO = Transabdominal hysterectomy and bilateral salpingo-oophorectomy
 BPND = Bilateral pelvic node dissection
 PAND = Paraaortic node dissection

SECTION II

- **Medical Personnel and Facilities**
- **Diagnostic Procedures
and Gynecologic Oncology Operations**
- **Publications & Presentations**

Medical Personnel and Facilities

TABLE 35: Medical Personnel and Facilities
in Division of Gynecologic Oncology, Chiang Mai University

Personnel and Facilities	Number
Medical doctor	10
General nurse	24
Practical nurse	12
Helper	6
Research nurse	1
Research assistant	1
Statistician	1
Inpatient bed	25
One-day chemotherapy bed	18
Outpatient bed	7
Colposcope	3
Cryosurgery set	1
Radiosurgery (Surgitron)	3

Funds (กองทุนของหน่วยงานวิจัยทางเวช)

1. Gynecologic Cancer Fund (กองทุนมะเร็งทางเวช)
2. Cervical Cancer Surgery Fund (กองทุนผ่าตัดมะเร็งปากมดลูก)

1st Year Fellow

- Napat Likkasittipan
- Wannaporn Sindnoi
- Wittawat Hanasa

2nd Year Fellow

- Varisa Chuenchitkultavorn, MD
- Chanita Lertaroonchai, MD
- Kankanok pooltim, MD

Radiation Oncologists

1. Professor Imjai Chitapanarux, MD
2. Associate Professor Ekkasit Tharavijitkul, MD
3. Somwilai Mayurasakorn, MD
4. Pitchayaponne Klunklin, MD
5. Wimrak Onchan, MD

Gynecologic Pathologists

1. Associate Professor Sumalee Siriaunkgul, MD
2. Professor Surapan Khunamornpong, MD
3. Associate Professor Jongkolnee Settakorn, MD
4. Assistant Professor Kornkanok Sukapan, MD
5. Tip Pongsuwareeyakul, MD

Medical Oncologists

1. Assistant Professor Busyamas Chewaskulyong, MD
2. Associate Professor Chaiyut Charoentum, MD

3. Thatthamn Suksombooncharoen, M

Diagnostic Procedures and Operations

TABLE 36: Diagnostic Procedures and Operations for Cervical Neoplasia

Procedures & Operations	Number
Colposcopy	
LEEP	75
Simple hysterectomy	7
Abandon hysterectomy	1
Modified hysterectomy & PL	2
Radical hysterectomy & PL	23
Laparoscopic hysterectomy	3

LEEP = Loop electrosurgical excision procedure

PL = Pelvic lymphadenectomy

TABLE 37: Operations for Ovarian, Corpus, and Vulvar Cancer

Operations	Number
CRS for ovarian cancer	43
CRS for fallopian tube cancer	7
CRS for peritoneal cancer	6
Surgical staging for corpus cancer	71
Laparoscopic hysterectomy for corpus cancer	14
BGND for vulvar cancer	2

CRS = Cytoreductive surgery

PL = Pelvic lymphadenectomy

BGND = Bilateral groin node dissection

PUBLICATIONS & PRESENTATIONS

2022

The Effects of Neurofeedback on Executive Functioning in Children With ADHD: A Meta-Analysis

Louthrenoo O, Boonchooduang N, Likhitweerawong N, Charoenkwan K, Srisurapanont M.

Objective: Possible beneficial effects of neurofeedback in improving ADHD functional outcomes have been increasingly reported. This meta-analysis aimed to evaluate the relationship between neurofeedback and executive functioning in children with ADHD.

Methods: PubMed, EMBASE, EBSCO, Web of Science, and Cochrane databases were searched to identify studies reporting the effects of neurofeedback on executive functioning, including response inhibition, sustained attention, and working memory, assessed by neuropsychological tests. Only randomized controlled studies of children aged 5 to 18 years were included using a random-effects model.

Results: Ten studies were included. The effects of neurofeedback were not found on three domains of executive functions. A meta-regression analysis revealed a trend of numbers of neurofeedback sessions positively associated with response inhibition ($p = .06$).

Conclusion: Results did not show the benefits of neurofeedback on executive functions assessed by neuropsychological tests. Future studies should focus on standard neurofeedback protocols, the intensity of intervention, and neuropsychological outcomes.

Published in: Journal of Attention Disorders. 2022;26(7):976-984.

DOI: 10.1177/10870547211045738

**The 7th Biennial Meeting of the Asian Society of Gynecologic Oncology,
November 25th to 27th, 2021**

Lertkhachonsuk AA, **Charoenkwan K**, Wilailak S, Kasemsarn P, **Srisomboon J**.

Abstract

[No abstract available]

Published in: Journal of Gynecologic Oncology. 2022;33(2):e36.

DOI: 10.3802/jgo.2022.33.e36

Prognostic Factors for Advanced Epithelial Ovarian Cancer Following Primary Cytoreductive Surgery or Neoadjuvant Chemotherapy

Nantasupha C, Muangmool T, Charoenkwan K.

Aim: To examine the association between clinicopathological factors and survival in advanced epithelial ovarian, tubal, and primary peritoneal cancers patients who had primary cytoreductive surgery (CRS) and those that received neoadjuvant chemotherapy (NAC).

Methods: Women who had CRS or NAC between 2008-2017 were included. Association between clinical characteristics, pretreatment imaging, serum markers, surgical and pathological factors, and disease recurrence/progression/death was examined in multivariable analysis.

Results: Two hundred and three women were recruited in this study (CRS 128 women and NAC 75 women). Median overall survival was 33.7 months for the CRS group and 27.9 months for the NAC group ($p=0.04$). Median progression-free survival was 14.9 months in the CRS group and 12.1 months in the NAC group ($p=0.04$). For the CRS group, factors independently associated with increased risk of death included primary peritoneal carcinoma (adjusted hazard ratio [aHR] 6.94), stable disease/ progression at treatment completion (aHR 5.97), and initial tumor size of more than 12 cm (aHR 1.87). For the NAC group, stable disease/progression after complete treatment (aHR 6.45) and pre-treatment platelet to lymphocyte ratio of more than 310 (aHR 2.20) were significantly associated with an increased risk of death.

Conclusions: NAC appeared to be a good alternative treatment for stage III/IV tubo-ovarian carcinoma. The worse survival outcome associated with primary peritoneal carcinoma and large initial tumor size in the patients who received CRS suggested that NAC could be an attractive option for those with these characteristics.

Published in: Asian Pacific Journal of Cancer Prevention. 2022;23(11): 3791-3799.

DOI: 10.31557/APJCP.2022.23.11.3791

Prevalence of malnourishment and predictive factors associated with the nutritional status of gynecologic cancer patients undergoing chemotherapy: a cross-sectional analysis

Sanguanwongthong K, Suprasert P.

Objective To investigate the prevalence and predictive factors of malnourishment in patients with gynecologic cancer during chemotherapy. **Methods** A total of 101 patients treated with chemotherapy between April 2020 and February 2021 were interviewed using the patient-generated subjective global assessment (PG-SGA). Clinical and laboratory data were also collected. The total number of lymphocytes per cubic milliliter (total lymphocyte count, TLC) and serum albumin were calculated to provide an optimal cut-off point using receiver operating characteristic curves. Clinicopathological variables were compared using univariate and multivariate analyses to identify the independent predictive factors for malnourishment. **Results** The prevalence of good, moderate, and severe nourishment was 73.3%, 18.8%, and 7.9%, respectively. The optimal cut-off points for TLC and albumin were 1,450 cells/ μ L and for albumin was 3.9 g/dL. Univariate analysis indicated that the number of chemotherapy cycles ≤ 3 , albumin level ≤ 3.95 g/dL, body mass index ≤ 25 kg/m², TLC $< 1,450$ cells/ μ L, anemia, and no neutropenia were significantly associated with malnutrition. However, only a serum albumin level ≤ 3.95 g/dL was independently associated with malnourishment. **Conclusion** Patients with gynecologic cancer treated with chemotherapy were occasionally found to be malnourished, with the independent predictive predictor being a blood albumin level less than or equal to 3.95 g/dL.

Published in: Obstetrics and Gynecology Science. 2022; 65(3):234-243.

DOI: 10.5468/ogs.21298

Prevalence and risk factor of post-operative lower extremities deep vein thrombosis in patients undergoing gynecologic surgery: a single-institute cross-sectional study

Lorchaivej S, **Suprasert P**, Srisuwan T, Rujiwetpongstorn J.

Background and aim: The study of prevalence and risk factors of postoperative lower limb deep vein thrombosis (DVT) in Thai gynecologic patients was limited. The present study was conducted to evaluate this issue.

Methods: The patients were age > 15 years old without a history of DVT or pulmonary emboli (PE) scheduled for laparotomy or vaginal gynecologic surgery between May and November 2020 were invited to participate. All of these patients were scheduled for a complete duplex ultrasound to detect lower limb DVT 72 h before and within 14 days after the operation. The patients without DVT were scheduled for an interview by telephone about DVT symptoms 30 days after the operation. The clinical variables were compared using univariate and multivariate analysis to identify the independent factors related to the development of DVT.

Results: One hundred and twelve patients met the inclusion criteria. Of these patients, 44 cases (39.3%) were diagnosed as malignancy and 102 patients underwent a hysterectomy. Post-operative DVTs were detected in six patients (5.4%) and all except one had a malignancy. Thus, the prevalence of DVT in malignancy cases was five in 44 patients (11.4%). The independent risk factors for postoperative DVT were age > 60-year-old and receiving a perioperative blood transfusion. Five of six DVT patients received low molecular-weight heparin for treatment of DVT and none developed PE. The rest of the participants reported no symptom-related DVTs from the interview 30 days after the operation.

Conclusion: The prevalence of postoperative DVT in gynecologic patients was 5%, and the independent risk factors were elderly patients and receiving a perioperative blood transfusion.

Published in: Thrombosis Journal. 2022;20(1):14.

DOI: 10.1186/s12959-022-00376-0

Predictive factors associated with resistance to initial methotrexate treatment in women with low-risk gestational trophoblastic neoplasia

Phianpiset R, Ruengkachorn I, Kuljarusnont S, Jareemit N, Udompunturak S.

Aim: To compare clinical characteristics and identify factors predictive of resistance to initial treatment with methotrexate-folinic acid (MTX-FA) in women with low-risk gestational trophoblastic neoplasia (GTN).

Methods: Retrospective chart reviews were conducted in patients diagnosed with low-risk GTN who were treated with MTX-FA at Siriraj Hospital between 2002 and 2018. Demographic data, disease characteristics, treatment response, toxicity, and data of the subsequent pregnancy were collected and analyzed. Groups of patients who were responsive or resistant to treatment were compared. Stepwise logistic regression analysis was used to identify factors predictive of resistance to methotrexate chemotherapy.

Results: Totally, 113 patients were eligible for analysis. The primary remission rate was 55.8% with first-line MTX-FA. All other patients achieved remission by subsequent treatment with actinomycin D or multiple-agent chemotherapy. Relapse of disease occurred in 4.4% and the overall survival rate was 99.1%. Univariate analysis showed that pretreatment serum hCG, neutrophil-to-lymphocyte ratio at baseline, and serum hCG ratio of the first three consecutive cycles (C) were significantly associated with resistance to MTX-FA. Independent factors that predict failure to respond to first-line MTX-FA were pretreatment serum hCG $\geq 15,000$ IU/L, a less than 4.8-fold reduction of serum hCG between cycle 1 and cycle 2 (C1/C2), and a less than seven-fold reduction of serum hCG from cycle 2 to cycle 3 (C2/C3).

Conclusions: First-line MTX-FA treatment is effective in 55.8% of patients. Pretreatment serum hCG, and serum hCG ratio between consecutive treatment cycles can predict initial treatment failure.

Published in: Asia-Pacific Journal of Clinical Oncology. 2022;18(5):e495-e506.

DOI: 10.1111/ajco.13774

Predicting the Risk Factors of Second Primary Cancer in Patients with Hepatocellular Carcinoma

Liao HH, Chang CC, Wang YX, Cheewakriangkrai C.

Screening for cancer and improved treatments have not only improved treatment outcomes and patient survival but have also led to an increase in the number of second primary cancers (SPCs). Hepatocellular carcinoma has been a common occurrence in Taiwan over the past decade. The mortality rate is second only to malignant tumors of lung cancer, and it also represents the fourth highest cancer medical expenditure. This study aimed to use machine learning to identify the risk factors for Hepatocellular carcinoma survivors. Of 378,445 datasets, including 15,251 from patients with SPCs, were collected; 18 predictive variables were considered risk factors for SPCs based on the physician panel discussion. The machine learning techniques employed included support vector machine, C5 decision tree, and random forest. SMOTE (Synthetic Minority Oversampling Technique) sampling method was used to resolve the imbalance problem. The results showed that the top 5 risk factors for SPCs were tumor size, clinical stage, surgery, total bilirubin, and BCLC Stage. The support vector machine method had the highest predicted accuracy (0.7673). The risk factors extracted from the classification models and association rules will be used to provide valuable information for HCC therapy.

Published in: Studies in Health Technology and Informatics. 2022;289:93-96.

DOI: 10.3233/SHTI210867

Minilaparotomy, Cyfra21-1, and Other Predicting Factors for Suboptimal Cytoreductive Surgery in Advanced Epithelial Ovarian Cancer: A Pilot Study

Nantasupha C, Pojchamarnwiputh S, Charoenkwan K.

Background: Currently, there is no reliable method to predict the result of the primary cytoreduction to decide whether to go on primary cytoreductive surgery or receive neoadjuvant chemotherapy. This study aimed to identify candidate predicting factors from clinical data, serum biomarkers, CT/MRI imaging, and minilaparotomy for suboptimal cytoreduction in women with advanced epithelial ovarian cancer.

Methods: Women who were clinically suspicious of advanced-stage epithelial ovarian, fallopian tube, and peritoneal cancer undergoing primary cytoreductive surgery were recruited. Clinical data, abdominopelvic CT/MRI, and serum biomarkers, including CA125, HE4, and Cyfra21-1, were collected preoperatively. At the start of the surgery, a minilaparotomy incision was made, the peritoneal cavity was assessed, and the operating surgeons gave the impression of whether the optimal cytoreductive surgery would be attainable. Subsequently, the incision was extended as necessary, and the standard cytoreductive surgery was attempted. After the procedure completion, the surgical outcome (optimal vs. suboptimal cytoreduction) and other operative outcomes were recorded. The association between the potential predicting factors and the surgical outcome was examined.

Results: Fourteen patients were included in this pilot study. Twelve patients were diagnosed with primary ovarian or fallopian tube cancer, while two had ovarian metastasis from colorectal cancer. The optimal cytoreduction was achieved in eight women. After minilaparotomy, the surgeons could predict suboptimal surgery correctly in five out of six cases (OR: 24.12, 95%CI: 2.34-Inf., $p < 0.01$). Moreover, no patient with the finding of rectosigmoid invasion from CT had optimal surgery (OR: 12.96, 95%CI: 1.26-Inf., $p = 0.03$). Lastly, increased serum cyfra21-1 (> 8 ng/mL) and HE4 (> 83 pmol/L) were significantly associated with suboptimal cytoreduction, with OR: 35.00, 95%CI: 1.74-702.99, $p = 0.02$ and OR: 15.00, 95%CI: 1.03-218.30, $p = 0.05$, respectively.

Conclusion: The finding of rectosigmoid invasion from abdominal CT, increased serum cyfra21-1 and HE4, and the initial minilaparotomy impression were potentially associated with suboptimal cytoreduction.

Published in: Asian Pacific journal of cancer prevention. 2022;23(12):4119-4124.

DOI: 10.31557/APJCP.2022.23.12.4119

Image Quality Classification for Automated Visual Evaluation of Cervical Precancer

Xue Z, Angara S, Guo P, Rajaraman S, Jeronimo J, Rodriguez A.C, Alfaro K, **Charoenkwan K**, Mungo C, Domgue J.F, Wentzensen N, Desai K.T, Ajenifuja K.O, Wikström E, Befano B, de Sanjosé S, Schiffman M, Antani S.

Image quality control is a critical element in the process of data collection and cleaning. Both manual and automated analyses alike are adversely impacted by bad quality data. There are several factors that can degrade image quality and, correspondingly, there are many approaches to mitigate their negative impact. In this paper, we address image quality control toward our goal of improving the performance of automated visual evaluation (AVE) for cervical precancer screening. Specifically, we report efforts made toward classifying images into four quality categories (“unusable”, “unsatisfactory”, “limited”, and “evaluable”) and improving the quality classification performance by automatically identifying mislabeled and overly ambiguous images. The proposed new deep learning ensemble framework is an integration of several networks that consists of three main components: cervix detection, mislabel identification, and quality classification. We evaluated our method using a large dataset that comprises 87,420 images obtained from 14,183 patients through several cervical cancer studies conducted by different providers using different imaging devices in different geographic regions worldwide. The proposed ensemble approach achieved higher performance than the baseline approaches.

Published in: Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics). 2022;13559: 206-217.

DOI: 10.1007/978-3-031-16760-7_20

Health-related quality of life for early-stage cervical cancer survivors after primary radical surgery followed by radiotherapy versus radical surgery alone

Suvannasarn R, **Muangmool T**, Wongpakaran N, **Charoenkwan K**.

This study compared the quality of life (QoL) of 265 stage IA2–IIA cervical cancer patients treated with radical surgery alone (group 1: 137 patients) versus those who underwent primary radical surgery followed by radiotherapy (group 2: 128 patients) and identified clinical characteristics that predict the poor quality of life. All participants completed quality of life questionnaires: EORTC QLQ-C30 and CMU cervical cancer QoL. For the EORTC QLQ-C30, the study groups were comparable regarding global health status/QoL scale and summary scores. Group 1 participants had better scores on the physical functioning domain and some symptom scales/items. For the CMU Cervical Cancer QoL, group 1 participants had better scores on gastrointestinal, lymphatic, and sexual/hormonal domains. In multivariable analysis, adjuvant radiation was consistently associated with poor quality of life in most domains. In general, early-stage cervical cancer survivors had a satisfactory quality of life. The clinical significance of the quality of life score differences between the study groups remains debatable.

What is already known on this subject? For women with early cervical cancer, surgery is the main treatment providing not only a good chance for a cure by total removal of the cancer but also an opportunity to preserve the hormone-producing function of the ovary as well as the flexibility of the vagina. However, radiation treatment may be indicated after surgery in some patients depending on the findings from surgery. Because of the concern about increased complications and decreased long-term quality of life following the combined treatments, some may elect to avoid surgery and receive radiation alone in the first place. In this study, we compared the quality of life of women who had surgery alone to those who had surgery followed by radiation. This information is currently lacking in the medical literature.

What do the results of this study add? We found that, in general, women with early cervical cancer had a satisfactory quality of life. For a patient who is surgically fit and chooses to receive primary surgery, if radiation is subsequently required, she could still expect the acceptable long-term quality of life—although slightly less satisfactory than receiving surgery alone but not inferior to those who receive primary radiation treatment.

What are the implications of these findings for clinical practice and/or further research? These findings will be useful for pre-treatment counselling and posttreatment supportive care. The information regarding disease-related and treatment-induced morbidity should be thoroughly discussed with the patients before and after treatment. Also, the use of questionnaires examining general well-being together with a cancer-specific quality of life is recommended for the systematic evaluation of cancer survivors.

Published in: Journal of Obstetrics and Gynaecology. 2022;42(5):1217-1224.

DOI: 10.1080/01443615.2021.1945013

Factors Influencing the Recurrence of Colorectal Cancer After Chemotherapy

Yu YH, Chang CF, Chang CC, Cheewakriangkrai C.

Globally, colorectal cancer is the most common cancer, and its incidence and mortality rates are significantly and rapidly increasing. In Taiwan, colorectal cancer screening and chemotherapy have improved the survival rates of patients but also increased the number of patients with recurrence. This study aimed to use machine learning to identify the risk factors for and clinical characteristics of colorectal cancer recurrence. From 2011 to 2018, 2,490 datasets, including 830 from patients with recurrence, were collected; 11 predictive variables were considered risk factors for recurrence based on literature review and physician discussion. The machine learning techniques employed included support vector machine, linear discriminant analysis, logistic regression, C4.5 decision tree, and random forest. SpreadSubsample sampling method was used to resolve imbalance problems. The results showed that the risk factors for recurrence, as ranked by importance, were pathological stage and surgical margins of the primary site. The C4.5 method had the highest mean predicted accuracy (0.8763). In patients who received chemotherapy, pathological stage group should be followed up for those with the colon cases and the number of invaded regional lymph nodes should be considered in patients with the rectum site. Clinical characteristic findings showed that for patients who did not receive chemotherapy, surgical margins of the primary site and number of invaded regional lymph nodes were risk factors that required joint follow-up for different primary sites.

Published in: Journal of Quality. 2022;29(3):235-249.

DOI: 10.6220/joq.202206_29(3).0004

Efficacy of Listening to Music on Pain Reduction during Colposcopy-Directed Cervical Biopsy: A Randomized, Controlled Trial

Pradit L, Tantipalakorn C, Charoenkwan K, Suprasert P, Srisomboon J, Muangmool T.

Background and Objective: To investigate the efficacy of listening to music on pain reduction during colposcopy-directed cervical biopsy (CDB).

Materials and Methods: From June 2020 to November 2021, 240 women undergoing CDB were enrolled. The participants were randomized into three groups: Group 1, colposcopic examination while wearing headphones and listening to music; Group 2, colposcopy while wearing headphones but not listening to music; Group 3 (control group), colposcopy while neither listening to music nor wearing headphones. All participating women completed a 10 cm visual analog scale for subjective pain at three time points: baseline, immediately after cervical biopsy, and 15 min after the procedure. The primary endpoint was the biopsy pain score.

Result: Of the 240 women, a sample size of 80 was randomly assigned per group. The clinical–pathological and procedure-related characteristics of the participants in all groups were similar. The mean baseline pain score between each group was not significantly different (2.83 in the music group, 2.54 in group 2, and 2.94 in the control group, $p = 0.47$). There were no significant differences between each group in terms of mean biopsy pain score (4.21 in the music group, 4.24 in group 2, and 4.30 in the control group, $p = 0.98$). The differences in changes between the baseline pain score and the biopsy pain score were not statistically significant (1.39 in the music group, 1.70 in group 2, and 1.36 in the control group, $p = 0.69$). In the multiple comparison analysis, the differences in changes between the biopsy pain score and the baseline pain score between each group were also not statistically significant. There were no complications with the intervention observed. **Conclusion:** This study demonstrated that there was no beneficial effect of listening to music on pain reduction during colposcopy-directed cervical biopsies.

Published in: *Medicina* (Lithuania). 2022;58(3):429.

DOI: 10.3390/medicina58030429

Effectiveness of enhanced recovery after surgery protocol in open gynecologic oncology surgery: A randomized controlled trial

Chiewhatpong P, Charoenkwan K, Smithiseth K, Lapisatepun W, Lapisatepun P, Phimphilai M, Muangmool T, Cheewakriangkrai C, Suprasert P, Srisomboon J.

Objective: To examine the effectiveness of applying the recommended enhanced recovery after surgery (ERAS) protocol compared with our usual care in women with gynecologic malignancy undergoing elective laparotomy.

Methods: From June 2020 to May 2021, 93 women with gynecologic cancers (cervix, endometrium, and ovary) undergoing elective laparotomy at our institution were randomly assigned into an intervention group (ERAS protocol, 46 women) or control group (usual care, 47 women). For the intervention group, each woman was brought through the pre-specified ERAS protocol starting from preoperative counseling to postoperative management. For the control group, participants underwent routine standard care. The primary outcomes were length of hospital stay and postoperative pain.

Results: The intervention group demonstrated shorter hospital stay by 20 h (47.48 h vs 67.17 h, $P = 0.02$) with lower postoperative pain score at postoperative day 0 (1.58 vs 4.00, $P < 0.01$) and day 1 (1.00 vs 2.67, $P < 0.01$) while having decreased opioid consumption ($P < 0.01$). The intervention group also had faster recovery of gastrointestinal function. Overall, good compliance to most of the ERAS pathway domains was obtained.

Conclusion: The ERAS protocol demonstrates benefits on shortening hospital stay, reducing pain, and bowel function recovery without increasing complications in our population.

Published in: International Journal of Gynecology and Obstetrics. 2022;159(2): 568-576.

DOI: 10.1002/ijgo.14211

Effect of cancer stage on health-related quality of life of patients with epithelial ovarian cancer

Techata A, Muangmool T, Wongpakaran N, **Charoenkwan K.**

We compared the quality of life (QoL) of women with early versus advanced epithelial ovarian cancer and examined predicting factors for the poor QoL. We classified 157 participants into 108 with early disease (stage I–II) and 49 with advanced disease (stage III–IV). They completed two questionnaires: EORTC QLQ-C30 and Chiang Mai University (CMU) ovarian cancer QoL. For EORTC QLQ-C30, the study groups were comparable regarding global health status/QoL, functional scales, and summary scores. The advanced group had worse scores on symptom scales specifically appetite loss and constipation. For CMU Ovarian Cancer QoL, the advanced group had worse scores only in the gastrointestinal domain but not in urinary, lymphatic, and sexual/hormonal domains. These findings remained mostly unchanged after excluding those with recurrence. In multivariable analysis, currently receiving treatment was consistently associated with worse QoL scores. The advanced stage had more adverse impact only on the gastrointestinal domains of QoL, mainly during periods of receiving chemotherapy.

What is already known on this subject? Survival outcome for women with epithelial ovarian cancer varies depending mainly on stage. Those who survive advanced stage disease could expect long-term disease and treatment-related morbidities that significantly affected QoL. However, there has been very limited information regarding QoL of women who have the early disease in comparison to those with more advanced disease especially in the context of Asian culture.

What do the results of this study add? Apart from the higher prevalence of gastrointestinal symptoms reported by the patients with advanced disease, the general well-being and other symptom-specific domains of QoL were comparable between women with early and advanced diseases. Receiving treatment is a consistent predictor for poor QoL.

What are the implications of these findings for clinical practice and/or further research? In comparison to early-stage epithelial ovarian cancer, the advanced stage had more adverse impact only on the gastrointestinal domains of QoL, mainly during periods of receiving chemotherapy. This information will be useful for patient counselling. Future research should examine the underlying causes of this finding.

Published in: Journal of Obstetrics and Gynaecology. 2022;42(1):139-145.

DOI: 10.1080/01443615.2021.1877647

Associations between Sex and Risk Factors for Predicting Chronic Kidney Disease

Kao HY, Chang CC, Chang CF, Chen YC, **Cheewakriangkrai C**, Tu YL.

Gender is an important risk factor in predicting chronic kidney disease (CKD); however, it is under-researched. The purpose of this study was to examine whether gender differences affect the risk factors of early CKD prediction. This study used data from 19,270 adult health screenings, including 5101 with CKD, to screen for 11 independent variables selected as risk factors and to test for the significant effects of statistical Chi-square test variables, using seven machine learning techniques to train the predictive models. Performance indicators included classification accuracy, sensitivity, specificity, and precision. Unbalanced category issues were addressed using three extraction methods: manual sampling, the synthetic minority oversampling technique, and SpreadSub-sample. The Chi-square test revealed statistically significant results ($p < 0.001$) for gender, age, red blood cell count in urine, urine protein (PRO) content, and the PRO-to-urinary creatinine ratio. In terms of classifier prediction performance, the manual extraction method, logistic regression, exhibited the highest average prediction accuracy rate (0.8053) for men, whereas the manual extraction method, linear discriminant analysis, demonstrated the highest average prediction accuracy rate (0.8485) for women. The clinical features of a normal or abnormal PRO-to-urinary creatinine ratio indicated that PRO ratio, age, and urine red blood cell count are the most important risk factors with which to predict CKD in both genders. As a result, this study proposes a prediction model with acceptable prediction accuracy. The model supports doctors in diagnosis and treatment and achieves the goal of early detection and treatment. Based on the evidence-based medicine, machine learning methods are used to develop predictive model in this study. The model has proven to support the prediction of early clinical risk of CKD as much as possible to improve the efficacy and quality of clinical decision making.

Published in: International Journal of Environmental Research and Public Health. 2022;19(3):1219.

DOI: 10.3390/ijerph19031219

An Unruptured True Aneurysm of the Uterine Artery during Pregnancy

Tantipalakorn C, Luewan S, Sirilert S, Tongsong T.

The antenatal diagnosis of an unruptured true aneurysm of the uterine artery is extremely rare and has never been reported, whereas pseudoaneurysms associated with previous trauma or cesarean section have been reported several times. True aneurysms occur when the artery or vessel weakens and bulges, sometimes forming a blood-filled sac. Nearly all cases of pelvic true aneurysms involved ovarian arteries which ruptured during the peripartum period. The case presented here is unique in terms of being an unruptured true aneurysm of the uterine artery with a first diagnosis during pregnancy at 32 weeks of gestation and the spontaneous development of thrombosis in the aneurysm in late pregnancy, documented at 37 weeks of gestation. The diagnosis of a true aneurysm of the uterine artery was based on, (1) a demonstration of the cystic mass located in proximity to the lower segment of the uterus with ultrasound characteristics of arterial flow in the mass, and (2) the occurrence in a woman who had no history of trauma or surgery in the pelvis. The finding during cesarean section confirmed the prenatal sonographic finding. The pregnancy ended with successful outcomes.

Published in: *Diagnostics*. 2022;12(10):2459.

DOI: 10.3390/diagnostics12102459

The Effects of Pelvic Floor Muscle Exercise Combined with Core Stability Exercise on Women with Stress Urinary Incontinence following the Treatment of Nonspecific Chronic Low Back Pain

Nipa S.I, Sriboonreung T, Paungmali A, **Phongnarisorn C.**

Aim: To compare the combined effects of core stability exercise and pelvic floor muscle exercise (PFME) with the effects of PFME alone on women with stress urinary incontinence (SUI) who experience nonspecific chronic low back pain (NSCLBP).

Methods: A stratified randomized controlled trial study (RCT) was conducted with 50 women with SUI who experienced LBP, aged 18-60 years and with pad weight ≥ 2 grams for the one-hour pad test. The respondents were divided into two groups: the intervention group (PFME + core stability exercise) and the control group (PFME). The primary outcomes were the amount and frequency of urine leakage, which were measured using the one-hour pad test and the Bengali-ISI subjective questionnaire. A secondary outcome was quality of life (QoL), which was measured using King's Health Questionnaire (KHQ). An ITT analysis was conducted using repeated measures ANOVA (2×2) with Bonferroni's post-hoc analysis.

Results/Preliminary Findings: The findings illustrated that 72% ($n = 18$) of the intervention and 28% ($n = 7$) of the control group participants showed improvement in UI after 12 weeks of intervention. In addition, the amount and frequency of urine leakage significantly decreased in the intervention group compared to the control group ($p \leq 0.001$).

Conclusion. The RCT-illustrated improvement of SUI in women with nonspecific chronic low back pain, reduction of frequency, and improvement of the QoL were more evident from PFME with core stability exercise than from PFME alone.

Published in: Advances in Urology. 2022; 2022: 2051374.

DOI: 10.1155/2022/2051374

Prevalence of Urinary Incontinence Among Hospital Based and Community Dwelling Women: A Survey

Nipa SI, Sriboonreung T, Paungmali A, **Phongnarisorn C.**

Objective: The aim of this study was to determine the prevalence of urinary incontinence (UI) among hospital based patients and community dwelling women.

Material and Methods: This prevalence survey was conducted with 334 respondents, using the Medical Epidemiological and Social Aspects of Aging and Incontinence Severity Index questionnaire.

Results: UI was highly prevalent in hospital patients; 34.1% (n=57) compared to community dwelling women; 10.2% (n=17). This study's findings determined a significant association of age along with the severity of UI among hospital based women, considering a p-value=0.030. In addition, this study illustrated a substantial association of musculo-skeletal conditions along with the severity of UI among hospital based women considering a p-value=0.018. Consequently, there was a significant association of musculo-skeletal conditions along with the severity of UI in community dwelling women (p-value=0.040).

Conclusion: Hospital based patients with musculoskeletal conditions predominantly suffered with UI more so than the community dwelling women. Further studies should be conducted to establish the reasons for the difference in ratios of UI among hospital based and community dwelling women.

Published in: Journal of Health Science and Medical Research. 2022; 40(3): 293-299.

DOI: 10.31584/jhsmr.2021837