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Philadelphia, PA

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FMX - AAFP
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ACOFP 62nd Annual Convention & Scientific Seminars
Palm Springs, CA

EDITOR'S MESSAGE

The Challenges of Medicine

Paula Gregory, DO, MBA, FACOFP

Medicine is challenging. Added to this are the struggles our patients face on a day-to-day basis. They have been exposed to situations that were unthinkable or not common 20 years ago. Some of these situations have changed, for better or worse, due to societal problems.

In 2012, the Centers for Disease Control and Prevention (CDC) was challenged to decrease deaths in motor vehicle accidents. This was related to the epidemic of young people killed in car crashes. This led to multiple changes that have decreased the death rate, with an estimated 600,000 lives saved over the next 50 years. Over the years, we have made changes that have led to front and side impact protection, seat belts, air bags, and decreasing speed limits.

We can solve large problems with multiple causes by careful thought. In 2021, a public health expert noted that 48,830 Americans died by firearms. Averaging one death every 11 minutes, the firearm homicide rate in the United States is 25 times higher than other high-income countries and the firearm suicide rate is 10 times that of other high-income countries. This does not take into account firearms injuries, or the family burden when a person dies or is injured. Between 2019 and 2020 the firearm homicide rate increased about 35%.

How often do we wish we had an opportunity to speak to our patients, families, and community prior to a tragic event? Six out of 10 adults are concerned about gun violence. Children are also impacted. Gun violence can contribute to problems in mental health and cognitive development, and as physicians we are also responsible for assessing and treating survivors. Statements from the American Academy of Pediatrics and strategies and resources from the CDC that focus on youth, suicide, and violence are available.

While we understand the scope of the problem and the impact on our patients, you are likely doing all that can be done. The CDC recommends some simple community efforts that would help. These include street outreach programs to connect people with services to reduce tension. They recommend maintaining green spaces by clearing vacant lots and planting grass and trees in high-risk areas. As a society, we can also help by strengthening economic and household stability through housing assistance, childcare subsidies, and other methods to support families.

SOURCES

1. Liwei L. Hua, Janet Lee, Maria H. Rahmandar, Eric J. Sigel, Suicide and Suicide Risk in Adolescents. Pediatrics January 2024; 153 (1): e2023064800. doi: 10.1542/peds.2023-064800.

2. Centers for Disease Control and Prevention, "Violence Prevention," https://www.cdc.gov/violence-prevention/index.html.

FROM THE PRESIDENT'S DESK

A Season of Milestones

Brian A. Kessler, DO, DHA, FACOFP *dist.*

As Dear Members,

As President of the American College of Osteopathic Family Physicians (ACOFP), I am delighted to extend a warm welcome to the readers of this summer issue of the Osteopathic Family Physician. This issue holds particular significance as we commemorate several remarkable milestones and events that resonate deeply with our profession.

First and foremost, we celebrate the birthday of Dr. Andrew Taylor Still, the founder of osteopathic medicine, who was born on August 6, 1828. Dr. Still's visionary approach to healthcare, emphasizing the body's innate ability to heal itself, laid the foundation for osteopathic medicine as we know it today. His legacy continues to inspire and guide us as we uphold the principles of patient-centered care. This year, as we mark the 150th anniversary of the osteopathic profession, we reflect on the profound impact that osteopathic medicine has had on the practice of medicine, improving the lives of countless patients worldwide.

In conjunction with this, we are also preparing for the 75th anniversary of ACOFP, a milestone that signifies our enduring commitment to advancing the field of osteopathic family medicine. Since our inception, ACOFP has been dedicated to supporting osteopathic family physicians through education, advocacy, and community engagement. As we approach this anniversary, we celebrate the achievements of our members and look forward to continuing our mission to promote excellence in family medicine.

The month of August also marks the beginning of the 2024-2025 academic year for our medical students and residents in family medicine. This new year presents a fresh opportunity for growth, learning, and the pursuit of excellence in osteopathic medical education. Our students and residents are the future of our profession, and we are committed to providing them with the knowledge, skills, and support they need to become outstanding osteopathic family physicians. We welcome them with open arms and encourage them to embrace the values and principles that have defined our profession for the past 150 years.

August is National Immunization Awareness Month, highlighting the importance of vaccination for people of all ages. As family physicians, we play a crucial role in educating our patients about the benefits of immunizations and ensuring they receive timely vaccinations. Immunizations are a cornerstone of preventive medicine, helping to protect individuals and communities from serious and potentially life-threatening diseases. During this month, let us redouble our efforts to advocate for vaccination and educate our patients about its critical role in maintaining public health.

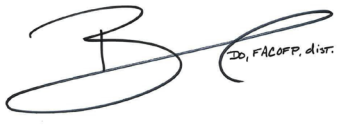
Additionally, August 19th is World Humanitarian Day, a day dedicated to honoring humanitarian workers and advocating for the well-being of people affected by crises around the world. This day reminds us of the importance of compassion, empathy, and service to humanity, values that are deeply embedded in the osteopathic philosophy. As osteopathic family physicians, we have a unique opportunity to make a positive impact on the lives of individuals and communities, locally and globally. Let us take this opportunity to reflect on our role as healers and advocates for those in need and recommit ourselves to the principles of humanitarianism in our daily practice.

As we celebrate these significant events and milestones, let us also look to the future with optimism and determination. The osteopathic profession has a rich history of innovation, resilience, and dedication to patient care. We have faced many challenges over the years, but our commitment to our patients and our profession has never wavered. Together, we will continue to advance the field of osteopathic family medicine, uphold the legacy of Dr. Andrew Taylor Still, and make a lasting impact on the health and well-being of our communities.

We also look forward to seeing all of our colleagues at the Osteopathic Medical Education Conference (OMED). Additionally, do not forget about the ACOFP 62nd Annual Convention and Scientific Seminars. Mark your calendars for April 2-6, 2025, and join us in Palm Springs, California, to celebrate the 75th anniversary of our family with a bang!

In closing, I extend my heartfelt gratitude to each of you for your unwavering dedication to the osteopathic profession and your commitment to excellence in family medicine. Your hard work, compassion, and expertise are the foundation of our success, and I am honored to serve as your President during this momentous time. Let us celebrate our past achievements, embrace the opportunities of the present, and look forward to a future filled with promise and possibility.

Sincerely,



Brian A. Kessler, DO, DHA, FACOFP dist.
2024–25 ACOFP President

REVIEW ARTICLE

Renal Cell Carcinoma from Screening to Surveillance: A Review

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KEYWORDS

Renal Cell Carcinoma

Staging

Nephrectomy

Surveillance

ABSTRACT

Renal cell carcinoma (RCC) is the most common type of renal cancer, and it is usually found incidentally in asymptomatic individuals. Despite an increase in prevalence, RCC mortality has improved. Advancements have been made over the years in diagnostic and treatment modalities and screening guidelines to decrease mortality rates. These guidelines are important to all, especially the primary care physician. A significant part of family medicine is preventative medicine, which focuses on screening for various diseases, including numerous cancers. Understanding epidemiology, risk factors, and staging is imperative to appropriately address RCC from surveillance to treatment. RCC encompasses many subtypes, thus making anatomy and histology important as defining characteristics, especially in screening and diagnosis. When directing treatment modality, staging, localization, and risk factors are essential. Understanding the steps required to improve survival rates is imperative to all physicians.

INTRODUCTION

Kidney cancer is primarily confined to the kidneys, while a small percentage has either spread to regional lymph nodes or metastasized to distant areas.[1] Renal cell carcinoma (RCC) is the most common type of kidney cancer as defined by the National Cancer Institute and arises from the renal cortex.[2] Throughout the years, there have been improvements in imaging modalities and treatment of various cancers. Kidney cancer's 5-year survival rate has gone from 30% in the 1960s to 75% due to improvements in guidelines. Specifically, when RCC is detected earlier and at a smaller size, it allows for a better response to treatment.[3] RCC often requires a multifaceted approach in which staging and understanding of the disease dictate treatment and guidelines.

EPIDEMIOLOGY

The U.S. Centers for Disease Control and Prevention (CDC) reports that an estimated 628,255 people in the United States are living with kidney and renal pelvis cancer, with ~81,000 new cases and ~14,000 deaths from RCC yearly, with higher prevalence in those with nonmodifiable risk factors.[4-6]

RISK FACTORS

RCC has many modifiable and nonmodifiable risk factors, which are important for physicians to consider when deciding which patients to screen for RCC. Nonmodifiable risk factors include male gender, advanced age, race, and genetic predisposition (those with von Hippel-Lindau [VHL] disease). In terms of race, a higher prevalence of RCC is seen in those of African American and American Indian backgrounds.[4-6] Modifiable risk factors associated with RCC include smoking, hypertension, chronic kidney disease, end-stage renal disease on hemodialysis, and obesity, all of which are areas primary care physicians can target to mitigate risk.[7-9]

TYPES OF RENAL CELL CARCINOMAS: ANATOMY AND HISTOLOGY

Before understanding screening and treatment guidelines, it is important to be familiar with types of RCC and the anatomy and histology behind each. RCC arises from the renal tubules and renal pelvis. The renal tubules are where 80% to 85% of RCC originates, and types include clear cell RCC, papillary RCC, chromophobe RCC, collecting duct RCC, and medullary carcinoma.[10]

Clear cell RCC and papillary RCC arise from the proximal collecting duct (PCT), with clear cell RCC encompassing 70% to 80% of adult cases of renal cancer and papillary RCC encompassing 10% to 20%.11 Clear cell RCC is associated with a deletion of chromosome 3p and microscopically has very pale or clear cell.[12] Papillary RCC, however, is associated with activation of the proto-oncogene tyrosine kinase c-Met with the majority of sporadic cases showing trisomy of chromosome 7.[13,14] Cancer cells in papillary RCC form finger-like projections (papillae) and are called chromophilic because cells take in certain dyes and look pink.[11] This RCC type can be further subdivided into type 1 and type 2 where type 1 is at an earlier stage and has a more favorable prognosis and type 2 is more aggressive with poor prognosis, as the disease is at a more advanced stage.[13-15] Chromophobe RCC, unlike clear cell and papillary cell RCC, originates from intercalated cells of the collecting system and encompasses less than 5% of RCC cases.[11] Cells of this type demonstrate a lack of abundant lipid and glycogen and are darker than clear cell carcinoma and larger.[16,17] When chromophobe RCC manifests, it is usually at a

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lower stage and there is a lower risk of disease progression and death.[18,19] Rare forms of RCC, <1%, originating from the renal tubules are collecting duct RCC and medullary carcinoma.[11,20] Collecting duct RCC is usually found in younger Black patients and is aggressive at its presentation.[21] Medullary carcinoma is a highly aggressive variant of collecting duct carcinomas and arises in the renal medulla from the distal segment of the collecting duct and is associated with sickle cell disease (SCD), whereby chronic medullary hypoxia leads to sickled red cells.[22]

Although RCC primarily originates from the renal tubules, transitional cell RCC arises from the renal pelvis tubules, where transitional cells look like cells that line the ureters and bladder, and encompasses 8% of all renal neoplasms.[2] This carcinoma occurs at a younger age, is female-predominant, presents at a later stage, and is associated with a poor prognosis in comparison to other RCCs.[23,24] Additionally, this type of RCC is resistant to targeted therapies but may be sensitive to immune checkpoint inhibitors.[25]

The anatomy and histologic classification of RCC are important when discussing imaging modalities used to localize disease by radiologists, as well as when discussing prognostic and therapeutic implications. Those types that share similarities may respond similarly to the same treatments. Furthermore, distinction between clear cell RCC and nonclear cell is imperative in discussing surgical vs nonsurgical treatment options.

SCREENING AND DETECTION GUIDELINES

Screening for RCC depends on risk, and due to the low prevalence of RCC in the general population, screening in asymptomatic patients is not recommended. However, due to high mortality rates—which have improved over the years—establishment of a screening program, especially in those with risk factors, may be appropriate to discuss.

The goal of an RCC screening program is to reduce deaths by identifying tumors at an early and treatable stage, but there are unknowns that remain. These unknowns consist of variables like cost-effectiveness of screening, survival benefit of early treatment, optimal screening modality, and target populations.[26] Additionally, screening can be financially burdensome on patients and lead to overdiagnosis. Studies performed over the years to answer the above unknowns have all had drawbacks, and results of the current prospective trial being conducted are still pending.[27] One such study is the Yorkshire Kidney Screening trial, which is using lung cancer screening via computed tomography (CT) with CT for RCC. Combing RCC screening with established national health check programs may be viable as it will reduce cost, but its validity is yet to be determined.[27]

RCC primarily is found incidentally on imaging, as most patients with RCC are asymptomatic and do not have the classic triad of hematuria, flank pain, and palpable mass.[27] RCC can be considered on a patient's differential based on clinical presentation and laboratory results. Hepatic involvement is uncommon but delineates a poor prognosis.[28] Certain presentations may make one more suspicious of RCC, like a male with a left-sided varicocele and symptoms such as flank pain or hematuria, as there is a close relation between the spermatic vein and left renal vein.[29] Additionally, if a patient has a high risk based on modifiable and nonmodifiable risk factors such as genetics, family history of renal cancer, race, smoking history, as well as being on hemodialysis, periodic monitoring with imaging is recommended by the American Urological Association.[26] CT with intravenous (IV) contrast is the gold standard for diagnosis and staging as it delineates the extent of involvement that will aid in choosing treatment options. However, other imaging can be utilized, as there is no agreed upon RCC screening protocol. Magnetic resonance imaging (MRI) can be used if imaging is inconclusive or if there is a contraindication. Ultrasound (U/S) is cost-effective, but it is less sensitive than CT. Additionally, false negatives can occur with U/S when masses are <3 cm.[30,31]

STAGING

Once RCC is diagnosed and imaging is done to confirm advanced vs localized disease, staging needs to be undertaken to determine treatment modality. RCC is divided into 4 stages: Table 1 will aid in understanding surgical vs nonsurgical treatments as well as surveillance.[2]

TREATMENTS

Primary care physicians should consider the interrelationship of structure and histology to direct treatment modality. Every RCC does not need to be treated or resected; some can be surveilled. Due to advancements in treatment and imaging modalities, which allow for better surveillance, RCC has seen improved survival rates throughout the years.

Treatment of RCC differs based on staging and whether the tumor is localized or disseminated. Earlier stages use a more surgical approach, whereas later stages use more targeted or palliative therapy.[10]

Earlier/Localized Disease, Stages I-III: Surgical Options

For clear cell and nonclear cell RCC, in cases where disease is localized and patients are classified into Stages I-III (as defined in Table 1), surgery is the definitive and curative treatment." Usually, radical nephrectomy is preferred for stages I to III, but partial nephrectomy is preferred in stage T1a or VHL.[32] Additionally, preoperative biopsies are not done prior to surgery due to low specificity and risk of seeding into the peritoneum.[33]

Radical nephrectomy is the most common surgical option for stages I to III RCC, but it can be utilized in advanced disease if there is direct involvement of the ipsilateral adrenal gland.[32] This procedure is done laparoscopically, usually with robotic assistance, and it removes the kidney, adrenals, and surrounding tissue and nearby lymph nodes, which can be potentially curative. The use of robotic assistance allows for shorter hospital stays and faster recovery, and it mitigates pain. However, it cannot be used if the tumor has grown into the renal vein or metastasized.[34]

TABLE 1:

Staging Renal Cell Carcinoma

STAGING RCC			
STAGE	**TNM**	**LOCATION**	**SUBDIVISION**
Stage I	T1N0M0	• Confined to kidney <7 cm • No lymph node involvement (N0) • No distant metastases (M0)	• T1a: ≤4 cm • T1b: >4 cm to ≤7 cm
Stage II	T2N0M0	• Confined to kidney <7 cm • No lymph node involvement (N0) • No distant metastases (M0)	• T2a: ≥7 cm to <10 cm • T2b: ≥10 cm
Stage III	T3 or any TN1M0	• Extends into major veins or perinephric tissues but not ipsilateral adrenal gland and not beyond Gerota's fascia • Possible spread to one regional lymph node (N1) • No distant metastases (M0)	• T3a: tumor extends into renal vein, or invades into parenchymal system or invades perianal or renal sinus fat but not beyond Gerota's fascia • T3b: tumor extends into vena cava below diaphragm • T3c: tumor extends into vena cava above diaphragm or invades wall of vena cava
Stage IV	T4 or any M1	• Invades beyond Gerota's fascia including extension into ipsilateral adrenal gland • Spreads to distant lymph nodes (N2) • Spreads to liver, lung, bone (M1)	None

Data gathered from: Garfield K, LaGrange CA. Renal Cell Cancer. In: StatPearls [Internet]. https://www.ncbi.nlm.nih.gov/books/NBK470336.

Partial nephrectomy, also known as nephron sparing, is preferred in stage T1a and VHL, because it allows for retention of kidney function. Usually, tumors that are <4 cm, early in stage, or isolated fall under this surgical option.[32] This treatment is not useful if there are multiple tumors in the same kidney, the cancer is not located peripherally, or it has spread to multiple lymph nodes or distant organs.

Other surgical options, like cytoreductive nephrectomy and metastatectomy, can be utilized in certain circumstances. Cytoreductive therapy can be done prior to initial systemic therapy in certain patients in whom 75% of debulking is possible and there is no symptomatic metastatic disease.[35] Metastatectomy can be undertaken if the primary tumor can be resected and there is concurrent single metastasis, whereby resection of the primary tumor with radical nephrectomy can be curative.[36] This form of surgery can also be done in those with recurrent disease or for palliative purposes in symptomatic stage IV patients.

Earlier/Localized Disease, Stages I-III: Nonsurgical Options

The majority of stages I to III RCC are either surveilled or treated surgically; however, in some cases, surgery is not an option. For example, if the mass is small or the patient is older with multiple comorbidities, surgery is avoided. In these cases, thermal ablation (cryotherapy or radiofrequency ablation) can be used, since most small tumors grow slowly and do not metastasize.[37] Cryotherapy and radiofrequency ablation as primary treatments are only possible in stage T1a patients, as these patients have masses that are <3 cm, have a high rate of being benign, and have low metastatic potential. Ablation of a mass >3 cm is associated with higher rates of recurrence and increased risk of complications, and thus is not recommended.[38,39]

Advanced/Metastatic Disease, Stage IV: Nonsurgical Treatment

Stage IV treatment depends on how extensive the metastasis is, the type of RCC, and the overall health of the patient. Those with advanced disease undergo risk stratification as delineated by the International Metastatic RCC Database Consortium (IMDC) to direct therapy (Table 2). Some patients with advanced disease may be able to undergo surgery but the majority utilize immunotherapy or targeted therapy as well as palliative procedures like embolization or radiation.[40] Risk factors and disease burden dictate surveillance vs nonsurgical treatment as noted in Table 3. Unlike with other cancers, chemotherapy is not a viable option in RCC.[40]

TABLE 2

Risk Factors and Prognosis

IMDC risk factors
• Karnofsky performance status <80%
• Decreased hemoglobin level
• Elevated corrected serum calcium
• Time from initial diagnosis to initiation of systemic therapy <1 year
• Neutrophilia
• Thrombocytosis
Score prognostic assessment
0: favorable
1-2: intermediate
≥3: poor

Data gathered from: Guida A, Le Teuff G, Alves C, et al. Identification of international metastatic renal cell carcinoma database consortium (IMDC) intermediate-risk subgroups in patients with metastatic clear-cell renal cell carcinoma. *Oncotarget*. 2020;11(49):4582–4592. doi:10.18632/oncotarget.27762

TABLE 3:

Disease Burden and Treatment Options

DISEASE BURDEN	IMDC RISK FACTOR SCORE	TREATMENT
Limited	0	Surveillance > Immunotherapy
Substantial	0	• Immunotherapy, molecular • Targeted therapy
Asymptomatic disease burden	≥1	• Immunotherapy • Molecular targeted therapy
Symptomatic disease burden	≥1	• Immunotherapy • Molecular targeted • Therapy • Palliative therapy

In the setting of clear cell RCC, if metastasis is suspected, pathologic confirmation is required prior to treatment. In patients who are treatment-naive with advanced or metastatic disease not controlled by local therapy, systemic immunotherapy via checkpoint inhibitors, or molecular targeted therapy, is a viable option. If the patient is asymptomatic and has favorable risk factors and limited disease burden despite being stage IV, active surveillance can be offered.[41]

In nonclear cell advanced RCC, treatment varies and depends on the histologic, pathologic, and molecular features of the tumor. Due to the paucity of these tumors, data on management are limited, but those with advanced disease have historically been treated palliatively.[42]

IMMUNOMODULATORS VS PALLIATIVE THERAPY

Checkpoint inhibitors

There are multiple immunotherapy options available to treat advanced disease with the most common being checkpoint inhibitors, which target cell death pathways or cytotoxic T-lymphocyte–associated antigen pathways.[43] Choice of immunotherapy depends on risks to the patient and type of RCC. Nivolumab (a programmed cell death protein 1 [PD-1] inhibitor) and ipilimumab (a cytotoxic T-lymphocyte antigen 4 [CTLA-4] inhibitor) combination therapy is indicated in intermediate or poor-risk patients.[44] Nivolumab can be offered to those with disease progression on vascular endothelial growth factor receptor (VEGFR) inhibitors in transitional cell carcinoma.[43,44] VEGF-targeted therapy blocks angiogenesis or tyrosine kinases that help tumors grow and survive. There are other options that can activate immune response against RCC and can result in tumor regression in genetic conditions like VHL; however, because of cost and toxicity, these options are not first-line in advanced kidney cancer. There are also therapies such as pembrolizumab, a PD-1 inhibitor, which is used 1 year postsurgery in those with high rates of recurrence to shrink tumors and slow their growth.[45]

Molecular targeted therapy

Targeted therapies used to treat advanced nonclear cell RCC consist of VEGFR inhibitors and mechanistic target of rapamycin (mTOR) modulators, which are used in multiple subtypes of RCC. Both VEGFR inhibitors and mTOR modulators are used in papillary RCC as either initial or subsequent therapy and in chromophobe RCC as initial therapy, as delineated in Table 4. VEGFR inhibitors can also be used as initial therapy in transitional cell and unclassified RCC.[46] Sunitinib is one example of a VEGFR inhibitor, which is used as a risk-lowering adjuvant in those whose cancer has a high risk of recurring following surgery.[45] These options, as well as less frequently used weekly IV treatments, are the cornerstone of treating advanced disease.

Chemotherapy

Most kidney cancers are resistant to chemotherapy, so it is not usually a viable option unless immunotherapy and targeted therapy have been tried and failed.[47] Chemotherapy when utilized is limited to platinum-based therapies and is used only in nonclear cell collecting duct and renal medullary carcinomas, where there is limited information regarding immunotherapy with checkpoint inhibitors.[48]

Palliative therapy

Even when utilizing targeted therapy, advanced disease has limited options and, as such, palliative therapy may be necessary. Palliative procedures like arterial embolization or radiation therapy in advanced disease stages can be utilized for symptomatic relief, especially in those with painful bone metastasis, brain metastasis after effective stereotactic radiosurgery, and in those who are unable to undergo surgery in stages I to III.[49]

TABLE 1:

Immunomodulators and Chemotherapy

TREATMENT					
Cancer type	Checkpoint inhibitor	mTor	VEGFR inhibitor	PD-1 inhibitor	Platinum-based chemotherapy
Papillary	X		X		
Chromophobe		X	X		
Collecting duct					X
Renal medullary					X
Transitional cell			X	X	
Unclassified	X		X		

SURVEILLANCE

Surveillance as opposed to surgical management is an option for select individuals because around 40% of tumors are <1 cm and benign.[2] For example, stage II or III patients can only undergo surgery as a primary treatment but stage T1a and select T1b patients can undergo surveillance as a primary treatment.[50] In addition to being used as a form of treatment, surveillance is also done after treatment in surgical and nonsurgical circumstances. Surveillance consists of a mixture of subjective and objective findings on doctor's visits, as well as imaging and laboratory results.

Surveillance after surgery

Surveillance is important after surgery due to risk of recurrence. Recurrence usually occurs within the first few years following surgery, and half of these recurrences usually develop in the lungs.[51,52] The National Comprehensive Cancer Network guidelines recommend surveillance in terms of clinical benefit within the first 5 years following surgery, and these recommendations differ based on staging and type of surgical intervention.[53] Surveillance after 5 years is at the discretion of the provider, as there is no consensus about optimal strategy.

Stage I RCC patients must see their physician every 6 months for the first 2 years, then annually up to 5 years regardless of type of surgical intervention.[53] At this visit they should have a complete metabolic panel (CMP). Regardless of the type of nephrectomy a patient underwent, a baseline CT scan of the abdomen and pelvis (CTAP) or U/S is recommended within 3 to 12 months of surgery, then annually for 3 years if the baseline scan is negative. If a partial or radical nephrectomy was performed, then surveillance beyond initial imaging is optional.[53] Due to lung involvement in recurrent disease, a CT chest scan is recommended annually for the first few years.

Unlike in stage I, if a patient had undergone a radical nephrectomy, an office visit and CMP are recommended every 3 to 6 months for 3 years and then annually for the next 2 years.[53] Like in stage I, a baseline CTAP is recommended within 3 months; however, follow-up imaging is done more frequently in stages II and III. A repeat CTAP is done in 3- to 6-month intervals for the first 3 years, then annually for the next 2 years if baseline imaging is negative.[53] A chest CT scan is recommended within 3 to 6 months after surgery, every 3 to 6 months thereafter for a total of 3 years, and then annually for an additional 2 years if baseline is negative.[53]

Surveillance for Nonsurgical Candidates

As discussed, those who are not surgical candidates and who have a small renal mass may undergo active surveillance as a primary treatment. This entails baseline CT scan of the chest or chest x-ray (CXR), laboratory tests annually, and CTAP with contrast within 6 months of surveillance initiation if no contraindication.[54] Serial abdominal imaging should be done yearly to evaluate changes in the renal mass and, depending on those changes, further imaging evaluation for lung metastases may be warranted.

Like those with a small mass, those who underwent thermal ablation will need to undergo a thorough checkup with basic laboratory work annually. CTAP with and without IV contrast should be done 1 to 6 months after ablative therapy, then annually for 5 years.[53]

Follow-up for Relapsed or Stage IV With Surgically Unresectable Disease

As discussed, some stage IV patients will undergo systemic therapy, as their disease will not be surgically resectable. Prior to using any systemic therapy, baseline CTAP is needed, and baseline brain imaging, spinal imaging, and bone scan can be considered.[53] Patients receiving systemic therapy should be seen every 6

months and basic laboratory tests targeted towards therapeutic agents and their adverse effects should be done frequently. For example, pazopanib, a tyrosine kinase inhibitor, can cause severe liver damage, clotting disorder, and arrythmias. Thus, laboratory tests to check liver function, coagulation, and electrolytes must be done in addition to periodic electrocardiographs (EKGs).[55]

CONCLUSION

RCC is a condition that affects thousands throughout the United States. A solid foundation of anatomy and histology is required to dictate screening, surveillance, and treatment. A multifactorial approach is needed to appropriately treat the disease and continue improving survival outcomes. Primary care physicians are placed in a unique position: in their practicing of preventative medicine, they may play a role in screening for RCC in high-risk individuals. To adequately care for patients with RCC, primary care physicians must understand the risks pertaining to this disease process, as well as the options specialists will discuss with patients. Surgery is not always an option—or rather is not always the best option—especially in advanced disease where immunotherapy or palliative therapy plays a more significant role. Treatment for RCC is multifaceted. Understanding the role of surveillance and the nuances it entails is imperative because primary care physicians will be following the patient's disease course from screening to surveillance.

LITERATURE SEARCH AND DATA SOURCES

The author's search strategy was to first log onto the NYTCOM library website and find a textbook with an overview of RCC to create an outline. The author used the CDC website to get information on statistics of RCC. Various journals such as J*ournal of Urology, New England Journal of Medicine, JAMA*, and *Journal of Clinical Oncology* were then utilized to search subjects such as RCC epidemiology, risk factors for RCC, and RCC and nephrectomy. She also utilized ClinicalKey and PubMed as well as the Cochrane database to gather information on RCC treatment. In addition, she searched NCCN guidelines for RCC surveillance. The author gathered her information from October 20, 2023 to November 24, 2023. After the end of November, she began to compile the article and edit and identify additional resources.

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REVIEW ARTICLE

VEGETARIAN EDUCATION IN TYPE 2 DIABETES PREVENTION

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KEYWORDS

Vegetarian Diet

Diabetes Prevention

Prediabetes

Hemoglobin A1c

Weight Loss

ABSTRACT

Past iterations of the Diabetes Prevention Program (DPP) have demonstrated success in reducing the risk of developing type 2 diabetes in high-risk individuals, including studies that focused on low-carbohydrate or ketogenic approaches. The program emphasizes dietary modifications, physical activity, and behavioral strategies to promote weight loss and improve metabolic health. While the traditional DPP focuses on a low-fat, calorie-restricted diet, there is growing interest in exploring alternative dietary approaches, such as vegetarian diets, which have shown promise in improving glycemic control and reducing cardiovascular risk factors. This study aims to evaluate the effectiveness of a 6-month vegetarian DPP in individuals with prediabetes. The study included 7 participants initially, but 2 dropped out, resulting in a final sample size of n=5. The program consisted of 16 sessions led by 2 certified DPP coaches, with a curriculum focused on education about healthy vegetarian diets, exercise, and lifestyle modifications. The primary results showed that while there was a slight decrease in weight and hemoglobin (Hb)A1c levels, these changes were not statistically significant, suggesting the need for further research with larger sample sizes and longer durations to validate these findings.

INTRODUCTION

The Diabetes Prevention Program (DPP), a Centers for Disease Control and Prevention (CDC)-accredited initiative established in 2002, has been instrumental in reducing the risk of type 2 diabetes through lifestyle interventions. This program underscores the importance of dietary modifications, physical activity, and behavioral strategies in enhancing metabolic health. Previous research has extensively explored indigenous, paleo, or ancestral diets, emphasizing whole foods, plants, and natural ingredients. In line with these principles, the initial objective of our study was to adopt a fully plant-based (vegan) approach. However, recognizing the challenges of low adherence and high dropout rates associated with such dietary regimens, particularly in the context of the DPP, we aimed to prioritize sustainability for our participants. Consequently, we opted for a vegetarian diet, focusing on the elimination of meats while maintaining nutritional adequacy and long-term feasibility. Touro University California has a history of conducting successful DPPs, including notable studies like the ketogenic study. Building on this foundation, our study focuses on evaluating the effectiveness of a 6-month vegetarian DPP in individuals with prediabetes. By adapting the DPP curriculum to align with vegetarian dietary principles, we aim to determine if a vegetarian DPP can achieve comparable or enhanced outcomes compared to traditional DPP programs. This research seeks to provide valuable insights into the development of personalized and effective diabetes prevention strategies, particularly in the context of the current diabetes pandemic.

METHODS

This study, approved by the Touro University California Institutional Review Board (IRB), utilized a prospective, single-arm, intervention design to assess the efficacy of a 6-month vegetarian DPP in individuals with prediabetes. Participants were recruited from the Vallejo/Bay Area community through diverse channels, including local businesses, schools, hospitals, clinics, the Touro University California campus, and previous DPP participant databases. Given the historical challenges with enrollment in DPP studies, we pursued diverse advertising channels to broaden participation opportunities. Advertising efforts were conducted, in part, through collaboration with high-risk ethnic populations, engaging centers of worship such as gurdwaras, mandirs, and temples. Touro University's DREAM (Diabetes Research Education and Management) team, with a history of collaboration with such

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organizations, facilitated the dissemination of study information. These centers permitted us to post flyers and actively promote our research within their communities. The DREAM team was instrumental in facilitating outreach to ongoing campus-run initiatives such as MOBEC (Mobile Diabetes Education Center) and SRFC (Student-Run Free Clinic), thereby extending the reach of our study within the community. Eligible participants were required to be 18 years of age or older and possess a clinical diagnosis of prediabetes or a history of gestational diabetes. Verification of eligibility was conducted based on initial hemoglobin (Hb)A1c readings and American Diabetes Association (ADA) guidelines. The work on which this manuscript is based received financial support from Touro University's DREAM team for classroom rental and participant prizes.

Seven participants initially enrolled, but 2 dropped out due to scheduling conflicts, resulting in a final sample size of n=5. The sample comprised 3 Asian, 1 Hispanic, and 1 Caucasian participant, with a gender distribution of 4 females and 1 male. The 6-month vegetarian DPP, led by 2 certified DPP coaches, comprised 16 sessions. Hourlong sessions were conducted weekly for the first 4 months and biweekly for the remaining 2 months at a local community center in Vallejo. The curriculum was tailored for a vegetarian study, emphasizing education on healthy vegetarian diets, exercise, and lifestyle modifications. The guidelines were derived from historical DPP curricula and refined in accordance with current ADA recommendations. Specifically, adjustments were made to align with contemporary guidelines for daily recommended macronutrient and micronutrient intake, as well as daily exercise quotas, screen time, and sleep duration. Participants were taught practical skills for implementing vegetarian diets and maintained food logs, which were reviewed and discussed in class.

Outcome measures included changes in HbA1c levels and weight, along with assessments of attrition rates, satisfaction, and attendance. Participants were given a survey to provide feedback on what should be improved or continued in future DPPs, the difficulty they experienced in adhering to the diet, and their overall enjoyment of the program. HbA1c levels and weight were measured at the beginning and end of the program, with weigh-ins at each session. Participants received a $25 gift card at the first session and a second $25 gift card at the final session as compensation for their participation. Data were analyzed using Microsoft Excel, with paired t-tests used to assess statistical significance. The study aimed to evaluate if a vegetarian DPP could achieve outcomes comparable to or better than traditional DPP programs, offering insights into personalized diabetes prevention strategies.

RESULTS

The mean starting weight of participants was 171.02 lb, which decreased to a mean final session weight of 168.04 lb (Figures 1 and 2), however this change was not found to be statistically significant (P=0.2817). The mean baseline HbA1c level was 5.88, which decreased to 5.82 by the final session (Figure 3). Like weight change, the change in HbA1c levels was not statistically significant (P=0.5012).

Participants' satisfaction with the study was high, and attendance was generally consistent throughout the program. Two participants dropped out due to scheduling conflicts, resulting in a final sample size of n=5. Despite these dropouts, the study maintained a high level of engagement among participants, indicating strong adherence to the program. Participants offered limited suggestions for improvements; however, a common theme emerged from their feedback: many highlighted their enjoyment of the team bonding experience, noting the formation of a strong sense of community. Most participants did not find the diet difficult to follow, and some even expressed interest in maintaining a vegetarian diet in the future. The study appeared to make vegetarianism seem less daunting, as the coaches provided instruction on various healthy lifestyle modification techniques to help participants incorporate less meat into their daily diet.

FIGURE 1:

Weight Trends in Participants

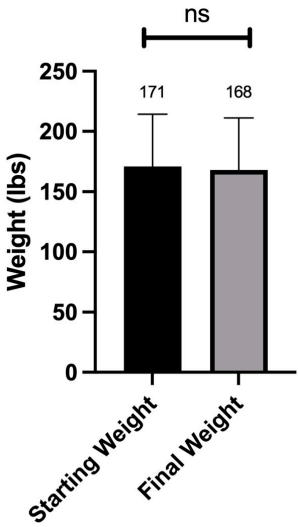


FIGURE 2:

Weight Trends in Participants

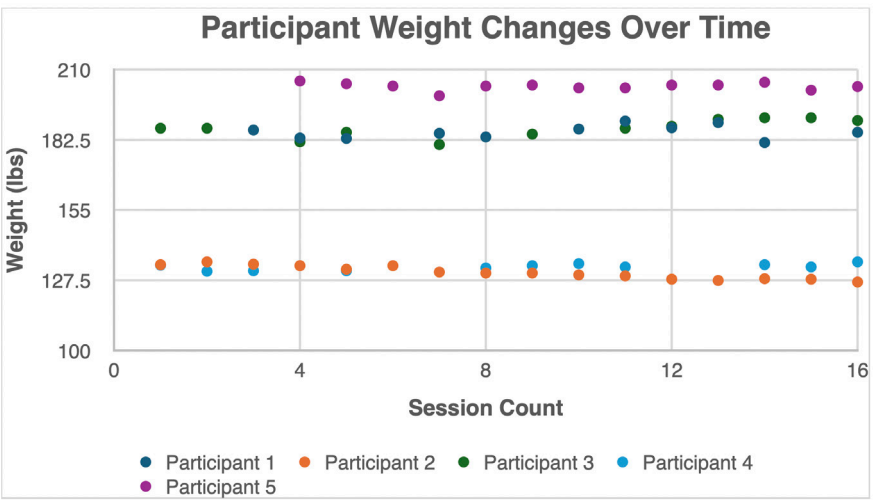
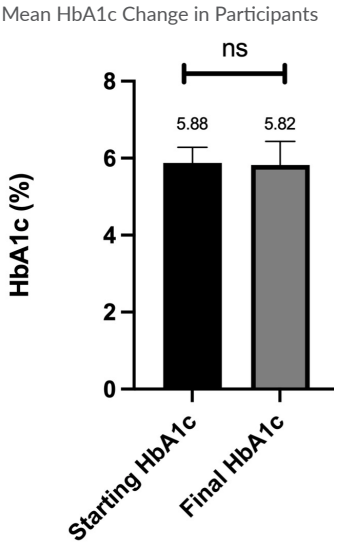


FIGURE 3:



DISCUSSION

The findings of this study indicate that despite the increasing interest in vegetarian diets for improving metabolic health, the 6-month vegetarian DPP did not result in statistically significant reductions in either HbA1c levels or weight compared to baseline measurements. This contrasts with some studies that have shown positive outcomes with other dietary approaches, such as low-carbohydrate or ketogenic diets. In retrospect, our decision to transition participants to a vegetarian diet proved to be a pragmatic choice, given the historical challenges observed in adherence and retention within lifestyle intervention programs like the DPP. While the initial aspiration was toward a wholly plant-based (vegan) regimen, participant self-reports indicated successful adherence to the vegetarian diet without experiencing feelings of undue restriction, underscoring its acceptability and feasibility within the study context. The lack of significant changes in HbA1c levels and weight could be attributed to several factors, including the small sample size and the relatively short duration of the intervention. Additionally, the reliance on self-reported dietary adherence may have introduced bias into the results. Future research should consider employing larger sample sizes and longer intervention periods to better assess the impact of a vegetarian DPP on metabolic health. Additionally, incorporating more objective measures of dietary adherence, such as biomarkers or dietary records, could provide more accurate insights into the effectiveness of the intervention. Further investigation is warranted to determine the optimal dietary strategies for preventing type 2 diabetes in high-risk individuals.

CONCLUSION

In conclusion, this study did not demonstrate significant improvements in HbA1c levels or weight loss among individuals with prediabetes or a history of gestational diabetes following a 6-month vegetarian DPP. While the findings do not support the effectiveness of this specific intervention, they highlight the need for tailored approaches in diabetes prevention. Understanding the impact of vegetarian diets on metabolic health remains an important area of research, especially given the global rise in diabetes prevalence. Clinically, these findings underscore the importance of comprehensive lifestyle interventions that consider individual dietary preferences and needs. Further research into alternative dietary approaches and their long-term effects is crucial for informing more effective strategies to combat the diabetes pandemic.

LITERATURE SEARCH AND DATA SOURCES

For this study, the search strategy focused on identifying the highest-quality evidence on the effects of a vegetarian DPP on HbA1c levels and weight loss in individuals with prediabetes or a history of gestational diabetes. Keywords used included “vegetarian diet,” “diabetes prevention,” “prediabetes,” “gestational diabetes,” “hemoglobin A1c,” and “weight loss.” The search was conducted from January to March 2024, and data sources accessed included PubMed, Cochrane Library, and relevant clinical trials databases for randomized controlled trials and systematic reviews. Additionally, reference lists of relevant articles and guidelines were reviewed to identify additional studies meeting inclusion criteria.

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REVIEW ARTICLE

EVALUATING GUIDELINES FOR TOBACCO CESSATION IN PREGNANCY: AN APPRAISAL USING THE AGREE II INSTRUMENT

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KEYWORDS

AGREE II

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Pregnant

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Guidelines

ABSTRACT

Background: Smoking is the most important preventable cause of adverse outcomes in pregnancy; however, most smokers who become pregnant continue to smoke and/or relapse following delivery. The identification of patients at risk can be challenging, and the treatment options available can be nebulous, including nonpharmacologic and pharmacologic options. The challenges of diagnosing and treating smoking in pregnancy prompt the use of clinical practice guides (CPGs). Several have been published to help identify at-risk patients and guide holistic management of tobacco use in pregnancy, however, to date, there has been no comprehensive review of guideline quality or methodologic rigor.

Methods: We conducted a comprehensive search of EMBASE, MEDLINE/PubMed, SCOPUS, and grey literature sources. The quality of these guidelines was assessed by 4 reviewers using the Appraisal of Guideline for Research and Evaluation, 2nd edition (AGREE II). Domain scores were considered of acceptable quality if they scored >60%, and Interclass correlation coefficients (ICC) were calculated to assess agreement among the appraisers.

Results: Seven guidelines were assessed for evaluation. Among these, only the World Health Organization (WHO) guidelines achieved an overall rating of "high." Three were "average" quality, and the remaining 3 were "low" quality. The "Scope and Purpose" domain achieved the highest mean score (88.7 ± 7.6), and the lowest was "Editorial Independence" (47.0 ± 27.6).

Conclusion: Areas of strength among the CPGs included "Scope and Purpose" and "Clarityand Presentation," as the guidelines were easily understood and described clear goals. The domains requiring improvement were "Editorial Independence," "Applicability," and "Rigor of Development," indicating that not all patients or providers may benefit from these CPGs. This analysis found one strong CPG pertaining to the management of tobacco use during pregnancy; however, several published guidelines lack methodologic rigor and have limited applicability.

INTRODUCTION

Tobacco use during pregnancy is a major public health concern and can have serious adverse effects on maternal and fetal health. In 2021 alone, approximately 4.6% of women who gave birth smoked cigarettes during pregnancy, with the highest rate among non-Hispanic American Indian or Alaska Native women (12.7%).[1] Smoking increases the risk of complications, including preterm birth, low birth weight, placental abruption, and sudden infant death syndrome.[2] Smoking can also affect the development of the fetus, causing impairments in cognitive, behavioral, and physical outcomes. Despite the well-known harms of smoking in pregnancy, many women continue to smoke or are exposed to second-hand smoking during this critical period. Pregnant smokers face several barriers including lack of support and access to effective interventions.[3] Nicotine dependance carries a high comorbidity with anxiety disorders, with heightened symptoms of anxiety reported in pregnant patients.[4,5]

The U.S. Preventative Services Task Force (USPSTF) recommends that physicians inquire about tobacco use during pregnancy,

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advise cessation at any stage of pregnancy, and provide behavioral interventions and pharmacotherapy.[6] Pregnant patients and fetuses benefit from smoking cessation at any stage of pregnancy, with the greatest benefits seen when patients quit prior to 15 weeks' gestation. Nevertheless, patients struggling with nicotine addiction face increased difficulties when attempting to quit smoking.[7] While counselling techniques have been found to have positive effects on smoking cessation during pregnancy, pharmacologic methods are also important adjuncts to facilitate this process.[8]

The challenges inherent to diagnosing and treating smoking in pregnancy suggest the use of clinical practice guidelines (CPGs). CPGs are systematically developed recommendations that enable informed physician and patient decisions.[9] It is imperative that CPGs are clear, applicable, and free from bias[10]; the Appraisal of Guidelines for Research and Evaluation (AGREE II) collaboration has developed a system by which to evaluate the quality of CPGs. The AGREE II is currently the most commonly applied and comprehensively validated guideline appraisal tool worldwide.[11] The instrument consists of 23 items that evaluate several quality domains.

The AGREE tools have been utilized for various medical topics and guidelines, and multiple countries and regions worldwide have assessed their local, national, and regional CPGs with this tool.[12] To the authors' knowledge, there has been no comprehensive review of CPGs relating to the care of smoking during pregnancy. This paper aims to assess the current practice guidelines for diagnosis and clinical management of tobacco use in pregnancy.

METHODS

Identification of Guidelines

A literature search was conducted with EMBASE, MEDLINE/PubMed, SCOPUS, and grey literature sources from inception through October 2022. The following terms were used for the search: "cessation"; "tobacco"; "pregnant"; "smoking"; "guideline"; and "recommendations." The search results were evaluated by 4 reviewers based on the Appraisal of Guidelines for Research and Evaluation, 2nd edition (AGREE II), as described below.

Selection of guidelines

Guidelines were selected based on whether they provided explicit recommendations for diagnosis and treatment of smoking in pregnancy. If multiple guidelines were offered by a single society, the most recent and updated version was evaluated. Supporting documents and appendices that were associated with each guideline were also evaluated by reviewers. Articles that were primary studies, clinical trials, textbook chapters, systematic reviews, letters, editorials, those without available full text, and those that were not published in the English language were excluded. The studied guidelines include those developed by the Australian Family Physicians (AFP), Oregon Health, National Institutes of Health (NIH), American College of Obstetricians and Gynecologists (ACOG), and USPSTF.

Quality appraisal

Four evaluators assessed each identified guideline using the AGREE II tool that is available through the AGREE website (www.agreetrust.org). Evaluators utilized the training material on the evaluation of guidelines that is offered for free on the AGREE website. Evaluation of guidelines using the AGREE II tool consists of assessing 6 domains that contain a total of 23 items. The 6 domains include: (1) scope and purpose, (2) stakeholder involvement, (3) rigor of development, (4) clarity of presentation, (5) applicability, and (6) editorial independence. Each domain was evaluated based on the items within each by assigning a score from 1 (strongly disagree) to 7 (strongly agree). Scores were then calculated and standardized as percentages of the maximum possible score for each domain using the following formula: (obtained score – minimum possible score)/(maximum possible score – minimal possible score). Standardized scores ranged from 0% to 100%. Standardized scores over 60% in a domain were deemed satisfactory. Over 60% on 5 or more domains in a CPG was rated as "high," while 3 or 4 domains over 60% were rated "average," and 2 or less domains over 60% were rated as "low." A mean score for each CPG was also calculated as an overall score.

Statistical Analysis

The interclass coefficients (ICC) analysis with 95% confidence intervals was used to assess agreement between the 4 evaluators. Agreement between evaluators was classified as very good (0.81-1.00), substantial (0.61-0.80), moderate (0.41-0.60), fair (0.21-0.40), or minor (0.01-0.20). Statistical analysis was performed using RStudio (Boston, MA).

RESULTS

Literature search yielded a total of 911 articles, 411 of which were from SCOPUS, 270 from PubMed, and 230 from EMBASE. There were 180 duplicates that were removed, leaving a total of 731 articles for screening. A total of 41 articles qualified for final review, with 5 of those deemed appropriate for appraisal. An additional 2 articles were identified using a Google search for a total of 7 CPGs selected for appraisal using the AGREE II tool (Table 1).

Guideline Characteristics

Analyzed CPGs were published between the years of 2011 and 2021. Information regarding the country of origin, targeted audience, method of development, and funding are noted in Table 1. There were 3 CPGs from the United States, one from Switzerland, one from Australia, and one from the United Kingdom. CPGs were developed through systemic literature review and expert panels. Those involved in the development of CPGs include obstetricians and gynecologists, family physicians, midwives, as well as various subcommittees. Funding was disclosed in 4 of the 7 CPGs.

TABLE 1: CPG CHARACTERISTICS

Developer	Pub. Year	Country	Development Method	Development Committees	Target Audience	No. of References	Funding Source
Society of Obstetricians and Gynaecologists of Canada (SOGC)	2011	Canada	• Systematic literature review • Expert panel	Obstetricians and gynecologists, family physicians	Healthcare providers	51	National Institute on Drug Abuse
World Health Organization (WHO)	2013	Switzerland	• Systematic literature review • Expert panel	• Gender • Reproductive rights • Sexual health and adolescents • Prevention of noncommunicable disease • Mental health and substance abuse • Gender, equity, and human rights • Epidemiology • Monitoring and evaluation • Research, evidence, and norms • Mental health and substance abuse • WP/TFI • Tobacco-free initiative	• Stakeholders • Policy makers	181	Not reported
Australian Family Physician (AFP)	2014	Australia	• Systematic literature review	Not reported	• Public and private health providers	46	None
Oregon Health Committees	2016	USA	• Systemic literature review • Expert panel	Not reported	• Pediatrics	2	None
National Institutes of Health (NIH)	2018	UK	• Systematic literature review	Midwife	• Those who are pregnant, plan to be, or are postpartum • Physicians	Not Reported	Not reported
American College of Obstetricians and Gynecologists (ACOG)	2020	USA	• Systematic literature review • Expert panel	OB/GYN and family physicians	• Clinicians • Those who are pregnant	Not Reported	Not reported
United States Preventive Services Task Force (USPSTF)	2021	USA	• Systemic literature review • Expert panel	Not reported	• Clinicians • Those who are pregnant	65	Agency for Healthcare Research and Quality (AHRQ) and Kaiser Permanente Evidence-based Practice Center (EPC)

TABLE 2: ICC FOR EACH DOMAIN

	Domain 1	Domain 2	Domain 3	Domain 4	Domain 5	Domain 6		
Society/ Institution	Scope and purpose %	Stakeholder involvement %	Rigor of development %	Clarity and presentation %	Applicability %	Editorial independence %	Domains ≥60/total domains	Overall quality
ACOG	86.1	36.1	37.5	80.5	40.0	27.1	2/6	Low
USPSTF	95.8	88.9	82.8	93.1	54.2	43.8	4/6	Average
AFP	93.1	63.9	22.9	73.6	43.8	50.0	2/6	Low
NHS	75.0	13.9	41.7	75.0	24.0	4.2	2/6	Low
Oregon Health	83.3	58.3	75.0	90.3	72.9	47.9	3/6	Average
SOGC	94.4	83.3	51.0	84.7	58.3	64.6	4/6	Average
WHO	93.1	90.3	93.2	79.2	77.1	91.7	6/6	High
Mean ± SD	**88.7 ± 7.6**	**62.1 ± 28.8**	**57.7 ± 26.2**	**82.3 ± 7.4**	**52.9 ± 18.7**	**47.0 ± 27.6**		

TABLE 3: INTRACLASS CORRELATION COEFFICIENTS (ICCS) FOR EACH DOMAIN

AGREE II DOMAIN	Intraclass Correlation Coefficient	95% Confidence Interval
Scope and purpose	0.988	0.835 to 0.989
Stakeholder involvement	0.821	0.789 to 0.984
Rigor of development	0.855	0.410 to 0.894
Clarity of presentation	0.790	0.110 to 0.915
Applicability	0.811	0.308 to 0.948
Editorial Independence	0.806	0.450 to 0.990

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Quality Assessment of CPGs

The ICC created from the 4 evaluators is presented in Table 2 and demonstrates an overall agreement between evaluators. Mean quality ICC scores for each domain across all CPGs are demonstrated in Table 3.

Scope and Purpose

The "Scope and Purpose" domain evaluates the objectives of the guideline and the patient population that it is targeting. The mean score for the "Scope and Purpose" domain was 88.7 ± 7.6, with all guidelines meeting satisfactory requirements with a score over 60%

Stakeholder Involvement

The "Stakeholder Involvement" domain evaluates whether the relevant stakeholders, including those who work with the target population and the target population itself, were included in the development of the guidelines. The mean score for the "Stakeholder Involvement" domain was 62.1 ± 28.8, with 4 guidelines meeting satisfactory requirements with a score over 60%.

Rigor of Development

The "Rigor of Development" domain assesses how the CPG was created and whether the potential benefits and risks of each recommendation have been considered. The "Rigor of Development" domain had a mean score of 57.7 ± 26.2, with 3 guidelines meeting satisfactory requirements with a score over 60%.

Clarity and Presentation

The "Clarity and Presentation" domain evaluated whether the recommendations presented are clear, concise, specific, and unambiguous so that they may be used effectively. The mean score for "Clarity and Presentation" was 82.3 ± 7.4, with all CPGs meeting the 60% satisfactory requirement.

Applicability

The "Applicability" domain focusses on the ability of the guidelines to be implemented in real-life situations that allow treatment of the target population. This includes barriers to using the guidelines such as resources and the ability to audit the guideline as needed. The "Applicability" domain received a mean score of 52.9 ± 18.7, and only 2 CPGs met satisfactory requirements with a score over 60%.

Editorial Independence

The "Editorial Independence" domain identifies whether the CPG was created with competing interests or funding that may have influenced how recommendations are made. The mean score of the "Editorial Independence" domain was 47.0 ± 27.6, with only one guideline meeting the satisfactory requirement of 60%.

Overall CPG Assessment

Of the 7 CPGs that were evaluated, one guideline created by WHO provided domain scores that achieved an overall rating of "high." The other 6 CPGs received scores of either "average" or "low."

DISCUSSION

Smoking during pregnancy increases the risk of serious adverse maternal and infant outcomes. Despite these known risks, there remains a high proportion of women who continue to smoke before and during pregnancy.[1] For physicians and providers, it can be challenging to diagnose and treat smoking during pregnancy, especially considering that the availability of recommended smoking cessation support remains suboptimal. Clinical practice guidelines provide recommendations aimed at enhancing patient care.[13] Their implementation minimizes variation in practice, in addition to improving the quality and safety of healthcare.[13] Having access to quality CPGs is crucial to improve clinical outcomes. The AGREE II instrument is utilized in this study to assess the quality of CPG in relation to the management of pregnant smokers. Seven CPGs from several countries were evaluated across the 6 AGREE II domains.

Scope and Purpose

Domain 1, "Scope and Purpose", examines whether a guideline expresses its goal clearly, emphasizes the health issues, and outlines its target demographic. All 7 guidelines scored highly in this domain. While all CPGs stated their objective, only USPSTF, Society of Obstetricians and Gynaecologists (SOGC), and the WHO guidelines were detailed and specific in each scenario they sought to answer. The clinical decision-making process and practice suggestions were very well understood with this form of structuring.

Stakeholder Involvement

This domain evaluates the authorship of the CPGs. Most CPGs fared poorly, indicating that there was inadequate professional variety in these developmental groups. The highest scoring guideline in this domain was the WHO guideline and included individuals with content expertise from several relevant fields, notably obstetrics, family physicians, medicine and tobacco use/control specialists, and epidemiologists.[14] This is essential due to the different aspects of treatment involved for smoking cessation. The WHO also thoroughly gathered public input on its suggestions prior to being published, with patients' expectations and experiences with medical care considered.[15] Moving forward, regional diversity should also be taken into consideration; despite the equal utilization of smoking cessation interventions, indigenous women were observed to experience higher rates of smoking during pregnancy in comparison to nonindigenous women in a study done in Olmsted County, Minnesota.[16]

Rigor of Development

The "Rigor of Development" domain evaluates the process used to develop the CPG and determine if the pros and cons of each guideline have been addressed.[17] Considering that this domain quantifies the empirical basis for published guidelines, it is thought to be the best indicator of overall guideline quality.[11] The WHO guidelines scored the highest quality in this domain, with development including a set of questions and outcomes that were provided to an international multidisciplinary team to review and prioritize.[14] After consulting a guideline development group, these were then employed as a guide for systematic reviews with an effort to include relevant non-English literature that had fulfilled certain inclusion criteria, as well as incorporating important relevant data from these studies.[14] Additionally, the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system was applied, which is a well-validated method for evaluating the quality of evidence supporting a particular recommendation.[18]

Clarity and Presentation

The CPGs performed best in this domain, with all 7 receiving high-quality ratings. This domain assessed whether the recommendations created were unambiguous, succinct, and explicit enough to be used effectively.[17] Simplicity was discovered to be the strongest independent predictor of guideline use in a survey of pediatricians' attitudes and practices, further supporting the significance of this domain.[19] The USPSTF guidelines, which achieved the highest score, had prominent listings of the main recommendations and highlighted several clear scenarios and the recommended intervention.

Applicability

This domain evaluates how well the guidelines can be applied to the actual cases to treat the intended population, as well as how well the recommendations stand in settings of varying resources and implementation challenges.[17] Only 2 CPGs (WHO, Oregon) achieved a high-quality rating, while the National Health Service (NHS) guideline had the lowest rating since it did not sufficiently examine how the available resources would affect the recommendation or detail advice on how to implement them in resource-limited cases.[20] The highest achiever in this domain is the WHO guideline, which included the most diverse patient presentation and information regarding the preferences of the targeted demographic.[14] The scores in this domain together with the "Stakeholder Development" domain point to a lack of

variety among the developers, as well as the target populations that these recommendations apply to. The only CPG that secured high scores in both domains was the WHO guideline. The WHO developing team involved experts in several fields, who considered feasibility an important factor when assessing the strength of recommendations. Another study highlighted that high expenditure was one of the main causes of pediatricians' lack of adherence to CPGs,[21] further emphasizing the importance of affordability.

Editorial Independence

This domain evaluates whether competing interests or financing could have impacted how the CPGs were developed. Only the WHO and SOGC guidelines achieved satisfactory scores, with the WHO guideline rated the highest since it included conflicts of interests and funding statements, indicating a high degree of transparency. This significant variability aligns with other AGREE II analyses[13,22] potentially due to financial information being less easily accessible in some CPGs. Disclosures are essential for all other academic work and CPGs should adhere to the same requirement.[17]

RECOMMENDATION

Only the WHO CPG was validated by this AGREE II analysis, achieving a score of "high quality" on all 6 domains and is therefore considered a "high quality" guideline. Table 4 summarizes the main recommendations from the WHO CPG for screening and management of smoking during pregnancy. These guidelines highlight screening for tobacco use and various treatment options together with supporting evidence.

LIMITATIONS

This study has several limitations. The accuracy of the medical information contained in CPGs is not evaluated by the AGREE II tool; rather, it assesses the clarity and methodologic rigor of CPGs. It is feasible that well-designed and understandable guidelines could provide false information. The AGREE II analysis cannot assess whether a CPG offers useful and pertinent advice. Thorough analysis is required to establish that the recommended guidelines are in fact indicated. Despite research showing that "Rigor of Development" and "Editorial Independence" are more strongly connected to superior guidelines, the AGREE II tool values all domains equally. Additionally, the AGREE II tool incorporates a subjective review by experts. Finally, suitable guidelines in non-English languages may have been overlooked in the literature search.

CONCLUSION

High-quality clinical practice guidelines can improve patient care and allow for evidence-based decision making. CPGs should be developed by experts along with input from the targeted population. Based on our analysis, the quality of current guidelines for detection and management of tobacco use during pregnancy requires improvement. Only one clinical practice guideline was identified as high quality using the AGREE II instrument. The study showed that the 2 domains with the most potential for development are "Applicability" and "Editorial Independence."

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REVIEW ARTICLE

CERVICAL CANCER SCREENING: REVIEW OF CURRENT RECOMMENDATIONS

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Oncology

Cervical Cancer

Sexual and Reproductive Health

Pap Smear

ABSTRACT

The annual rate of cervical cancer death has been in slow decline in part due to the broad implementation of screening technology. This annual death rate is also affected by risk factor exposure and discovery of new treatments. While the current rate, 2.2 deaths in 100,000 women, is the lowest recorded, cervical cancer still claimed the lives of over 5000 women last year. Early detection through screening remains central to the fight against cervical cancer. Current cervical cancer screening guidelines are provided and updated by professional organizations including the U.S. Preventive Services Task Force (USPSTF), American College of Obstetricians and Gynecologists (ACOG), Society of Gynecologic Oncology (SGO), American Society for Colposcopy and Cervical Pathology (ASCCP), and American Cancer Society (ACS). As the primary interface between the public and the healthcare system, and as purveyors of preventative medicine, it is the charge of the family physician to be current and well-versed in cervical cancer screening guidelines.

INTRODUCTION

Since being introduced in the late 1940s, the Papanicolaou (Pap) smear has remained the cornerstone of cervical cancer screening[1-3] and has helped to reduce rates of cervical cancer.[4] That being said, testing and prevention methods have become more sophisticated over time leading to a variety of changes in guidelines for when and how the test should be administered. One recent change in human papilloma virus (HPV)-related cancer prevention that can be readily accessed in primary care is the Gardasil 9 vaccine, introduced in 2014.[5] Wide availability of safe and effective HPV vaccines, as well as improving HPV DNA testing, have the potential to change screening guidelines in the near future,[6-8] with guidelines already changing in some countries[8]; however, as of this publication, the 2018 guidelines remain in place in the United States.[9] In any case, early detection and treatment remain central to reducing HPV-related cancers, particularly cervical cancer, as its indolent course can be devastating by the time of symptom onset.[10] This paper will provide a detailed review of current guidelines regarding cervical cancer screening from a variety of expert organizations including U.S. Preventive Services Task Force (USPSTF), American College of Obstetricians and Gynecologists (ACOG), Society of Gynecologic Oncology (SGO), American Society for Colposcopy and Cervical Pathology (ASCCP), and American Cancer Society (ACS) with the goal of providing concise clinically relevant information for the practicing family physician. For brevity, a variety of acronyms are used throughout this paper, and are detailed in Table 1.

METHODS

Literature Search and Data Sources

Guidelines as published by expert organizations through their respective official channels were automatically included in our analysis. Current USPSTF guidelines were obtained from the USPSTF website (https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/cervical-cancer-screening),including the active research regarding potential guideline changes 6,7,9,11 on April 24, 2024. As of that date, the USPSTF guidelines from 2018 remain the most current version. More recently published 2020 guidelines from ACS were also reviewed,[12] as well as an updated guideline statement published by ACOG and reaffirmed in 2023.[13] Database searches were conducted on April 24, 2024. Cochrane Library (https://www.cochranelibrary.com/search?cookiesEnabled), PubMed (https://pubmed.ncbi.nlm.nih.gov/), and AHRQ Effective Healthcare Program (https://effectivehealthcare.ahrq.gov/) database searches for keywords "cervical cancer screening," Pap smear," and "Pap test" were undertaken. Inclusion criteria were for papers that primarily discussed cervical cancer screening, and for those focused on clinical practice guidelines. Papers mentioning cervical cancer screening, but with a primary focus on other subjects were excluded. Due to the vast breadth of results in the PubMed

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database, results were principally restricted to 2020 to present, and filtered to only include clinical practice guidelines. The search strategy is summarized in a Prisma-style flow diagram[14] in Figure 1. Four relevant reviews were identified from Cochrane library.[15-18] Of the 4 papers identified, one was identified by Cochrane to be out of date and subsequently excluded.[15] After filtering and exclusion, 3 records from PubMed were ultimately reviewed for analysis, although other papers are cited where necessary to provide context; one of these was found to be focused on information for laboratories receiving cytologic samples rather than on clinicians and was subsequently exluded.[19] Search of the AHRQ Effective Healthcare Program database ultimately yielded no additional results for analysis after excluding those that did not meet criteria.

ANALYSIS

Guidelines for cervical cancer screening from USPSTF and major relevant clinical societies (ACOG, SGO, ASCCP, ACS) were used in this review and can be seen in Table 2 below. The 2018 USPSTF guidelines are endorsed and adopted by ACOG, SGO, and ASCCP. These shared guidelines were compared to the 2020 ACS guidelines to determine agreement between these expert organizations. Also included were National Institutes of Health (NIH) guidelines screening for patients with HIV, for which an equivalent comparison was not included in the ACS guideline statement. Finally, we reviewed recommendations from ACOG and ASCCP regarding the approach to abnormal cervical cancer screening results, which are summarized for rapid reference for use by clinicians.

FIGURE 1.

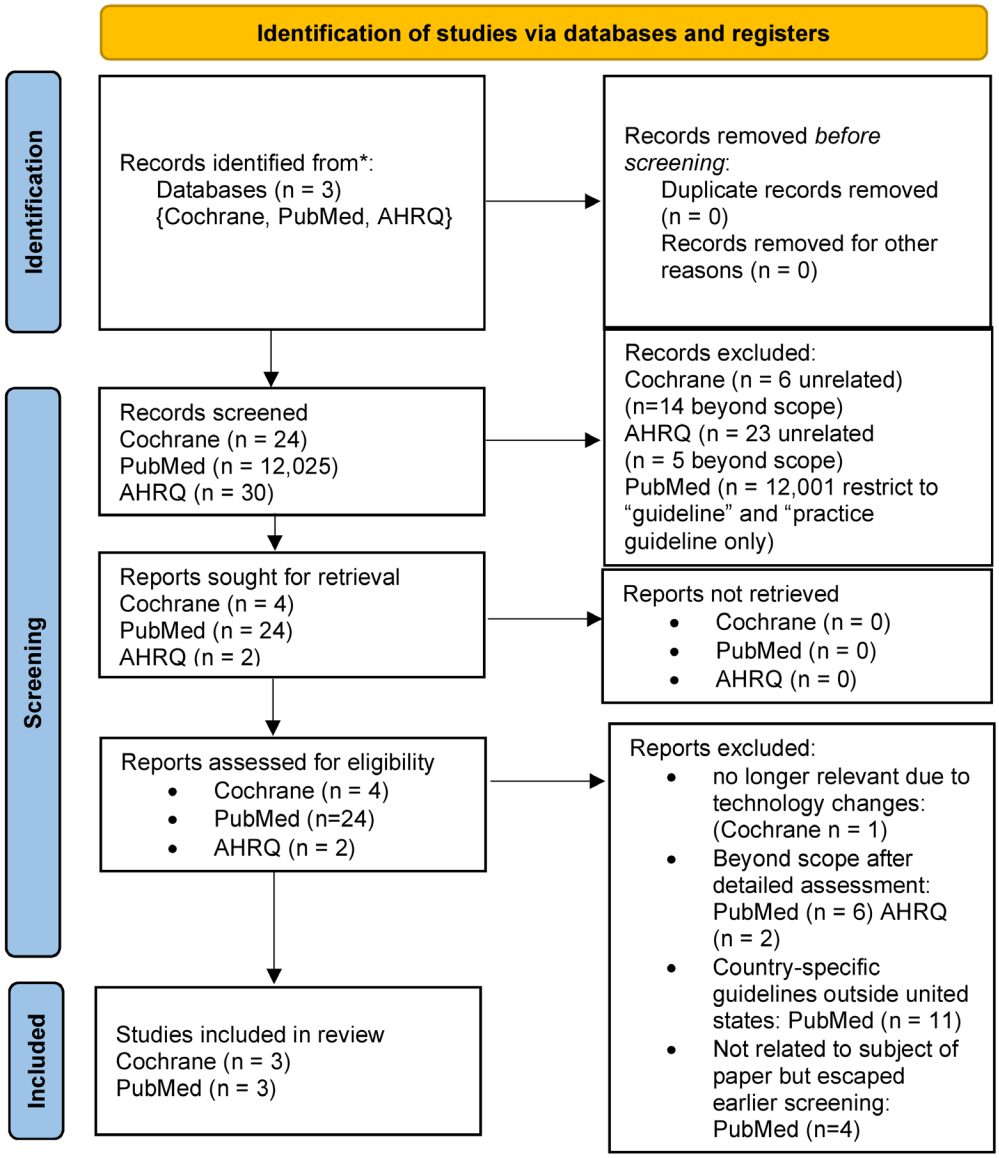


TABLE 1:
Acronyms used in this text

Abbreviation	Full Text
USPSTF	United States Preventive Services Task Force
ACS	American Cancer Society
ACOG	American College of Obstetricians and Gynecologists
ASCCP	American Society for Colposcopy and Cervical Pathology
SGO	Society for Gynecologic Oncology
AHRQ	Agency for Healthcare Research and Quality
CDC	Centers for Disease Control and Prevention
HPV	Human papilloma virus
HIV	Human immunodeficiency virus
HAART	Highly active antiretroviral therapy
NILM	Negative for intraepithelial lesion or malignancy
ASCUS	Abnormal squamous cells of unknown significance
LSIL	Low-grade squamous intraepithelial lesion
HSIL	High-grade squamous intraepithelial lesion
ASC-H	Atypical squamous cells, cannot rule out high-grade lesion
AGC	Atypical glandular cells
AIS	Adenocarcinoma in situ
CIN 1	Cervical intraepithelial neoplasia, grade 1
CIN 2	Cervical intraepithelial neoplasia, grade 3
CIN 3	Cervical intraepithelial neoplasia, grade 3
CIN 3+	Cervical intraepithelial neoplasia, grade 3 or adenocarcinoma in situ

RESULTS

Cervical Cancer Screening

USPSTF[9] guidelines for screening average-risk patients, endorsed by ACOG, SGO, and ASCCP13 for cervical cancer screening, as of this time remain concordant, while ACS guidelines have shifted to reflect newer technology, as shown in Table 2. Briefly, USPSTF continues to recommend initiation of screening by Pap test alone every 3 years from ages 21 to 30 years, followed by either continued Pap test every 3 years, or Pap with HPV co-test or HPV test alone every 5 years until age 65 years. After age 65 years, Pap tests may be discontinued if there are 3 negative cytology results or 2 negative co-testing results within 10 years and the most recent test occurred within 5 years.

TABLE 2:
Current guidelines for cervical cancer screening in the general population from USPSTF and ACS

Population	USPSTF 2018 (endorsed by ACOG, ASCCP, and SGO)	ACS 2020
<21 years	• Screening not recommended	Screening not recommended
21-24 years	• Cytology alone every 3 years	Screening not recommended
25-29 years	• Cytology alone every 3 years	• HPV testing every 5 years • Co-testing (HPV testing with cytology) every 5 years • Cytology alone every 3 years
30-65 years	• Cytology alone every 3 years • HPV testing every 5 years • Co-testing (HPV testing with cytology) every 5 years	• HPV testing every 5 years • Co-testing (HPV testing with cytology) every 5 years • Cytology alone every 3 years
>65 years	Screening not recommended if adequate prior screening and low risk for cervical cancer	Screening not recommended if adequate prior screening and low risk for cervical cancer
History of hysterectomy with removal of the cervix	Screening not recommended unless history of a high-grade precancerous lesion (ie, cervical intraepithelial neoplasia [CIN] grade 2 or 3) or cervical cancer	
Any age with limited life expectancy		Screening not recommended

ACS, by contrast, recommends screening to start at age 25 years, and to use primary HPV testing without a Pap test every 5 years until age 65 years. ACS recommendations also state that Pap test every 3 years or co-test every 5 years is a reasonable alternative in areas where primary HPV testing is unavailable.[12]

Of note, USPSTF is currently in the process of reviewing and updating cervical cancer screening guidelines. This is bolstered by maturation of HPV testing technology, which allows for better sensitivity and specificity as compared to Pap testing, particularly when Pap testing is done without an HPV co-test.[8] The United States is large and heterogeneous in population and area as compared to countries that have moved toward exclusive primary HPV testing, which has complicated the large-scale conversion to new testing modalities.

Patients with HIV

Infection with HIV can increase risk of HPV infection and cancers resulting from HPV infection,20 In fact, rates of cervical cancer in individuals with HIV are approximately 4 times higher than the general population, despite the availability of effective highly active antiretroviral therapy (HAART).[21] Based on the higher risk for this population, cervical cancer screening guidelines vary as compared to those at average risk.

Typically, those 21 to 29 years at time of HIV diagnosis should have a Pap test (without HPV co-test) at time of initial diagnosis with HIV. Even if the initial Pap test is normal, it should be repeated annually for 3 years. If the results of 3 consecutive cervical cytology studies are normal, patients may then transition to Pap test every 3 years until age 30 years. HPV testing is not typically done in addition to Pap testing in this population due to the extremely high prevalence of infection leading to false positives.[22]

Patients aged 30 years or above at initial HIV diagnosis should have a Pap smear with HPV co-test at time of diagnosis. If both tests are negative, continue Pap with HPV co-testing every 3 years for life—an important difference from the general population.[22]

Perhaps unsurprisingly, abnormal test results for this population require closer follow-up than those among the general population. Particularly, the threshold for colposcopy is much lower. Generally speaking, atypical squamous cells of undetermined significance (ASCUS) with negative HPV testing requires a repeat Pap test in 1 year. ASCUS with positive HPV testing requires colposcopy. Any more significant results (eg, low-grade squamous intraepithelial lesion [LSIL], high-grade squamous intraepithelial lesion [HSIL]) warrant colposcopy regardless of HPV co-test result, as do high-risk HPV genotypes even with normal cytology.[22] See Table 3 for more details, including comparison to guidelines for the general population.

HPV vaccination is still recommended for prevention in this population, with one key difference: the recommended age for primary immunization remains the same as for individuals without HIV, however, among those with HIV infection, HPV vaccination always requires a 3-dose series, regardless of the age at which it is given.[22]

Approach to Abnormal Screening Results

The appropriate response to abnormal cervical cancer screening results depends largely on the result in question and, more importantly, the likelihood of progression to a clinically significant lesion. The most recent recommendations from the ASCCP, developed in 2019, shifted from a focus on cytology results to a comprehensive and complex risk assessment that tailors management to each patient based on history, risk factors, previous screening results, HPV testing, and cervical cytology. These changes aimed at reducing the burden of unnecessary colposcopies in low-risk patients. Current ACOG guidelines note a full endorsement of those published by ASCCP. They state a preference for HPV testing as a core component of screening, whether primary HPV testing or cytology (Pap) with HPV co-test.[23]

TABLE 3:
Current guidelines for cervical cancer screening in patients with HIV vs the general population

	Patients With HIV (increased risk)	General Population (average risk) {USPSTF guidelines}
21-29 years	• Cytology at time of diagnosis and yearly for 3 years even if normal	• Cytology alone every 3 years
30+ years	• Co-testing at diagnosis	• Cytology alone every 3 years OR • HPV testing every 5 years OR • Co-testing (HPV testing with cytology) every 5 years
>65 YEARS	• cotesting at diagnosis • if negative cytology and HPV, then repeat every 3 years for life OR • If cotesting not available, then cytology at diagnosis and yearly for 3 years even if normal • If 3 consecutive normal results, then cytology every 3 years for life *option to discontinue in patients with limited life expectancy	

Broadly speaking, abnormal tests can require follow-up with surveillance, colposcopy, or treatment. How to proceed is determined by the likelihood of progression to cervical intraepithelial neoplasia grade 3 or above (CIN 3+). This includes CIN grade 3, adenocarcinoma in situ, and cancer. CIN 3 is defined as a precancerous lesion of greater than two-thirds the thickness of the cervical epithelium.[24] Treatment for these high-grade cervical lesions includes excisional and ablative options, while cervical cancer treatments escalate to chemotherapy and/or surgery (hysterectomy).

Currently, guidelines recommend follow-up for any comprehensive risk assessment result of 4% or more for development of CIN 3+. Risk assessment results can be categorized as high, low, or intermediate risk for progression, with intermediate- and high-risk results meeting criteria for further evaluation.

Low-risk results would include first-time negative for intraepithelial lesion or malignancy (NILM) with positive HPV test, ASCUS with negative HPV test, and first-time LSIL with negative HPV test. Intermediate-risk results would include ASCUS with positive HPV test, LSIL with positive HPV test, and second-time NILM with positive HPV test. High-risk results include HSIL, atypical

TABLE 2:

List of possible Pap smear test results and further management.

Pap test results	Definition	Next Steps
NILM	Negative for intraepithelial lesion or malignancy, ie normal	See figure 2.
ASC-US	Atypical squamous cells of uncertain significance	See figure 3.
LSIL or CIN1	Low-grade squamous intraepithelial lesion Cervical intraepithelial neoplasia grade 1	See figure 4.
HSIL or CIN2, 3	High-grade squamous intraepithelial lesion Cervical intraepithelial neoplasia grade 2, 3	See figure 5.
ASC-H	Atypical squamous cells, cannot rule out a high-grade lesion	See figure 5.
AGC	Atypical glandular cells	Colposcopy

FIGURE 2.

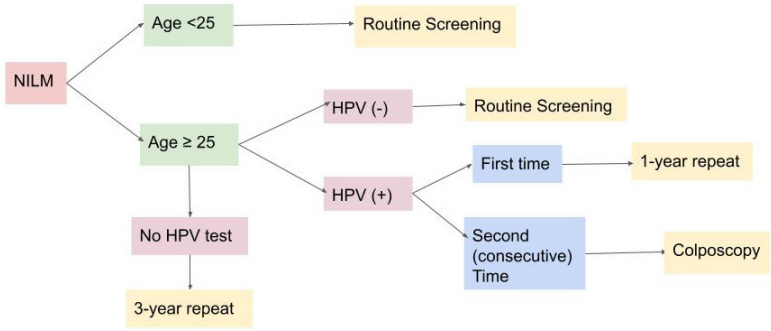


FIGURE 3.

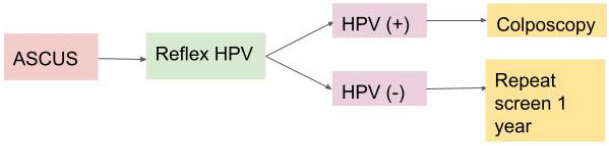


FIGURE 4.

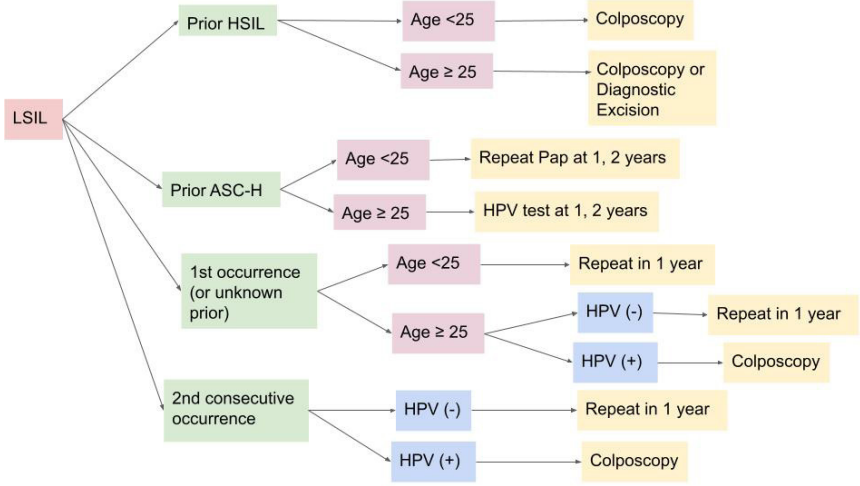
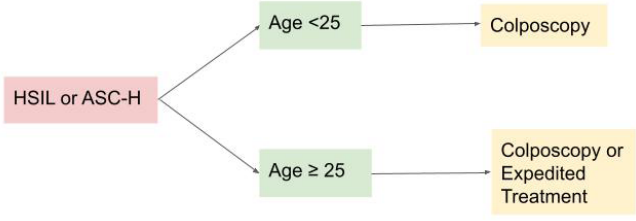


FIGURE 5.



squamous cells, cannot rule out high-grade lesion (ASC-H), and AGC [atypical squamous cells where HSIL cannot be excluded and atypical glandular cells]. Results are summarized in Table 4, and the basic approach to their management appears in Figures 2 to 5 with references in Table 4. Adenocarcinoma in situ (AIS) management is not included in the figures; this should always receive expedited treatment. Similarly, AGC is not shown in the figures; this result should lead to colposcopy and endometrial sampling if the patient is not pregnant.[22]

There are more possible situations and risk strata than were able to be summarized here, and readers may refer to Perkins, et al. for additional details if needed for their clinical context.[23] Figures are intended to provide guidance for common clinical situations and do not represent an exhaustive list of possible results and outcomes. Additionally, guidelines only apply to asymptomatic individuals; those with symptoms should be managed as appropriate for disease state.

Improving Adherence to Follow-up After Abnormal Results

Rates of inadequate follow-up after abnormal pap results range from 4% to 75%,25 highlighting a significant opportunity for improvement in management. Individual factors associated with poor follow-up include younger age, lower socioeconomic status, lack of health insurance, and lower education, while protective factors include regular visits with a primary care provider and direct communication of abnormal test results. Thus in order to improve follow-up, consider direct notification of abnormal laboratory results, appointment reminders via telephone or text messages, and improving patient self-efficacy through education initiatives and even HPV self-sampling.[25,26]

CONCLUSIONS

Despite the wide availability of an effective vaccine, HPV infection and HPV-related cervical cancers remain disturbingly common. Increased vaccination rates have potential to dramatically change this reality within many of our lifetimes. However, at this time, cervical cancer screening to allow early identification and treatment remains a necessity. As of April 2024, Pap testing with or without HPV co-testing is still the standard of care per USPSTF guidelines. It is the authors' opinion that USPSTF guidelines will most likely be updated to offer an option for either continued screening, per existing 2018 guidelines, or for younger patients, initiating screening per the newer ACS guidelines. This is likely due in part to disparities in availability of screening tools in the heterogeneous communities of the United States. Regardless, it will remain vitally important for family physicians to continue to assist their patients in obtaining appropriate screening and follow-up based on those results.

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BRIEF REPORT

RESOLUTION OF CHRONIC COCCYDYNIA AFTER OSTEOPATHIC MANIPULATIVE TREATMENT: A CASE REPORT

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KEYWORDS

Coccydynia

OMT

Coccyx

Sacrum

Balanced Ligamentous Tension

ABSTRACT

Coccydynia is characterized by pain or discomfort in the coccyx region, most frequently caused by direct trauma. This condition, exacerbated by sitting on flat or hard surfaces, may cause immobility and adversely impact activities of daily living. Standard treatment options include ergonomic adaptations, manual or physical therapy, nerve blocks, and surgery. Currently, there is very little evidence supporting the use of osteopathic manipulative treatment (OMT) as a therapeutic option for patients with chronic coccydynia. The authors describe the case of a 26-year-old, previously healthy, highly active, female competitive volleyball player who developed chronic coccydynia following direct trauma to her coccyx. At first visit, her pain levels were 10/10, requiring persistent use of a donut pillow and decreasing her engagement in physical activities. Yet, after one treatment session involving intrarectal manipulation of the coccyx using OMT, pain immediately decreased posttreatment and was nonexistent by 6-month follow-up. The patient no longer required a donut pillow and returned to competing in volleyball at a high level. Given the limited treatment options for coccydynia, OMT should be further explored as a standardized therapeutic option, considering the significant impact of coccydynia on patients' quality of life and the excellent safety profile of OMT compared to current standard pharmaceutical or surgical options.

BACKGROUND

Coccydynia is characterized as pain or discomfort in the coccyx region. Direct trauma is the leading cause of coccydynia in 50% to 65% of cases. The severity of trauma may lead to additional injuries, including sprain of pelvic floor muscles or severe fracture-dislocation of the sacrococcygeal complex.[1] Risk factors for coccydynia include female sex and obesity, with a body mass index (BMI) over 27.4 kg/m2 in females and 29.4 kg/m2 in males.[1,2] Patients with coccydynia typically experience sharp, shooting, or aching pain in their coccygeal or sacral region. In many, sitting exacerbates this and may hinder daily activities.[1,2] They may also present with hypermobility or immobility.[2] Although static images are inconclusive in many patients with coccydynia, primary investigation indicates lateral and anterior to posterior (AP) radiographs. Computed tomography (CT) is also recommended for a definitive diagnosis of fracture or dislocation.[1,2] Dynamic imaging may assess angular mobility in patients with unremarkable static imaging.[1,2]

Standard treatment options in the treatment of coccydynia include ergonomic adaptations (donut pillows, postural training, stool-softening measures), manual or physical therapy, injection and nerve blocks, and surgery. Ninety percent of patients have success with conservative treatment. First-line treatment is ergonomic adaptations with nonsteroidal anti-inflammatory drugs (NSAIDs). Manual therapy, featuring massage and manipulation, is often successfully used in treatment.[1,2] Specifically, pelvic-floor rehabilitation is beneficial in cases of coccydynia associated with pelvic muscle spasms.[3] Rectal massage of the levator ani, coccygeus, and piriformis muscles has resolved symptoms in 25% of cases.[3] Second-line treatment includes steroid and anesthetic injections.1 Surgical intervention to remove the coccyx via coccygectomy is indicated upon failure of all conservative methods and injections.[1]

Use of osteopathic manipulative treatment (OMT) to treat coccydynia, while infrequently studied, has demonstrated success. Suggested techniques may include direct or indirect myofascial release, counterstrain, and balanced ligamentous tension to the sacral and pelvic region.[4] Intrarectal treatment of chronic coccydynia has enabled symptomatic improvement in many cases. One study, performed by Jean-Yves Maigne, MD, demonstrated a success rate of 25.7% at 6 months' follow-up in subjects treated

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The patient in this study provided written informed consent for utilization of their case in the case report..

with intrarectal manipulation.5 In this study, participants received three 5-minute sessions of intrarectal manipulation over 10 days involving stretching of the levator muscle and mobilization of the coccyx. Additionally, a survey by Origo et al. demonstrated the efficacy of fascial unwinding techniques targeting abdominal and pelvic fascial tension alongside intrarectal mobilization, as performed by Maigne in reducing pain associated with coccydynia.[2]

CASE REPORT

The patient was a 26-year-old, female, right-hand–dominant volleyball player who presented to the clinic complaining of pain in her coccyx. The pain began approximately 6 months prior, after several incidents involving direct trauma to her coccyx. The first occurred during a game of volleyball in which she fell backward and landed in a seated position with her knees extended in front of her. She recalled feeling a tingling sensation shoot down her toes bilaterally immediately afterward but continued to play despite the injury. She experienced soreness in her sacrum and coccyx for several days following the incident. The following month, she was playing volleyball on wet grass, which led to a loss of friction with one leg during a play, causing her to go into a side split, falling backward directly onto her sacrum and coccyx. She was able to finish the rest of the game, albeit uncomfortably. However, since the second injury, she continued to have pain in the region of her coccyx. She did not utilize any over-the-counter pain relievers or topicals. She did continue to see her chiropractor, who she was seeing biweekly before the incidents, but they referred her to her primary care physician for further evaluation. Her primary physician elected to get plain radiographic imaging of the area, which showed no evidence of fracture or dislocation. The patient was subsequently prescribed celecoxib and gabapentin for conservative pain treatment, but she did not take either medication. Since then, she has continued to have pain, requiring a donut pillow when sitting, particularly on hard surfaces. At the time of her visit, she endorsed a 6/10 pain while standing that worsened to 10/10 when sitting on hard surfaces or with specific movements. Physical examination notably revealed an antalgic gait. Additionally, osteopathic structural examination revealed a right parietal strain; C3 extended, rotated left, sidebent left; C7 extended, rotated left, sidebent left; T7 neutral, rotated right, sidebent left; rib 1 right inhaled; L2 flexed, rotated right, sidebent right; right innominate anterior rotation and outflare, left innominate posterior rotation and outflare; bilateral S5 tenderpoints; coccyx anterior and rotated right; bilateral posterior fibular heads.

TREATMENT APPROACH

OMT with balanced membranous tension (BMT), Still technique, articulatory technique (ART), facilitated positional release (FPR), high-velocity-low-amplitude (HVLA), low-velocity-low-amplitude (LVLA), muscle energy, soft tissue, and ligamentous articular strain (LAS) were performed to the somatic dysfunctions mentioned previously. All treatments were performed after receiving verbal consent from the patient and with a female chaperone in the room. The patient was provided a gown for modesty. The physician washed his hands thoroughly before putting on nitrile exam gloves. For the intrarectal treatment, the patient lay in the left lateral recumbent position. The physician lubricated the glove on his right hand before entering the rectum. The physician's left hand monitored externally at the sacrococcygeal junction. The sacrum was balanced around the transverse axis using BMT. The physician palpated several restriction points in the sacrum and the coccyx and noted the coccyx to be mildly rotated in a counterclockwise direction, with restriction in the clockwise rotation and gapping of the sacrococcygeal joint. BMT was performed on the coccyx until a spontaneous audible "pop" was felt by both the patient and the physician. Immediately, the patient endorsed a decrease in the intensity of her pain. Treatment ended after this audible release, and the physician and chaperone left the room so the patient could change back into her regular clothing.

Upon returning to the room with the patient's mother, the patient conveyed a notable decrease in pain, registering it as 0/10, and experienced an emotional release, expressing her sense of relief. She returned to the clinic for a 1-week follow-up, during which time she stated her pain was at a 4/10 resting pain, and she continued to use a donut pillow for pain relief when sitting on hard surfaces. She endorsed soreness in the sacrococcygeal region but stated it had improved every day since treatment the week prior. She was treated during the follow-up visit for temporomandibular joint pain using BMT. Her pelvis and sacrum were again assessed, and she was found to have a left anteriorly rotated innominate and left inflare, which were treated with muscle energy. She also had bilateral sacroiliac (SI) restrictions, which were treated with HVLA and BMT.

The patient was called for a 6-month follow-up, during which time she stated that her pain had entirely resolved. She endorsed 0/10 pain, sits comfortably on hard surfaces without the use of a donut pillow, and has returned to regularly playing volleyball, although she is more cautious of her intensity levels so as to not re-injure herself.

Discussion

Coccydynia can be a significant source of chronic pain and decreased quality of life. Due to its complex nature, over 20% of patients with chronic pain are ultimately prescribed opioids, contributing to our current epidemic.[6] Ultimately, persistent cases can lead to surgical removal of the coccyx via coccygectomy, which has been shown to have a success rate of around 75% with a complication rate of 11%.7 One prospective study in 98 patients with chronic coccydynia who underwent coccygectomy found a 30% failure rate, with up to 6% reporting disability scores even worse than presurgery.[8] Our patient initially presented to us 6 months after her first traumatic event with ongoing pain that greatly interfered with her quality of life as a 26-year-old who was previously highly active. Immediately after one intrarectal treatment, her pain dramatically improved, decreasing from 10/10 pain to 4/10 pain after 1 week. Pain levels were 0/10 by 6 months, and she was back to regular activities.

Emerson et al. reported similar findings with intrarectal manipulation of the coccyx in a 60-year-old female with chronic coccydynia secondary to a motor vehicle accident. In their case, they performed OMT under anesthesia as an adjunct therapy to epidural steroid injections; after 3 such treatments, the patient reported complete resolution of symptoms.[9]

Previous literature describing intrarectal manual treatments suggests that the mechanism involves relaxation of intrapelvic muscles and mobilization of a stiff coccyx, both of which may have been contributory etiologic factors.[5] In the case presented here, the treatment was targeted at balancing the sacrum, followed by the coccyx. The fact that there was an audible "pop," suggesting a release and restoration of normal anatomy, may indicate that there was a disturbance of the coccyx about the sacrococcygeal junction. Another possibility is that the patient was 26 years old, and individual vertebrae of the coccyx often do not completely fuse until up to age 30 years.[10] Therefore, it is feasible that there was a minor disturbance between 2 of the coccygeal vertebrae rather than the entire coccyx about the sacrococcygeal junction. However, prior imaging suggested that there were no signs of either a fracture or a dislocation, which may actually indicate that intrarectal palpation of the coccyx about the sacrococcygeal joint may be sensitive to minor disturbances in the normal anatomy, which may otherwise not be noticed on plain radiographs. In the case of our patient, the physician was able to palpate a counterclockwise rotation of the coccyx. It is known that rotation of the coccyx has been related to coccydynia, especially after minor trauma.[11] This may suggest that future studies are indicated to explore the incorporation of intrarectal examination as part of the routine diagnostic workup for coccydynia, which is not currently the standard.

Because this case report is anecdotal, it would be inappropriate to generalize the efficacy of OMT in the treatment of chronic coccydynia. In light of the complex nature of coccydynia, its drastic impact on the affected patient's quality of life, and the current lack of effective treatment options, it would be wise to conduct further studies to explore the efficacy of OMT in a broader population of patients with chronic coccydynia. This is especially indicated because the nature of these treatments is very gentle and associated with minimal to no adverse effects.

CONCLUSION

In conclusion, this case report highlights the potential effectiveness of OMT, including intrarectal manipulation, in the treatment of chronic coccydynia. In this case of a 26-year-old female, the pain went from a 10/10 pain at the time of presentation to almost complete resolution with 0/10 pain at the 6-month follow-up after just one treatment. The audible release and immediate pain reduction observed in this patient suggest that OMT may address subtle disturbances in coccygeal anatomy that are not always detectable through standard imaging. While this anecdotal evidence is promising, further research is warranted to evaluate the broader applicability of OMT in treating this debilitating condition. Given the limited treatment options and the significant impact of coccydynia on patients' quality of life, exploring OMT as a therapeutic option is a valuable avenue for future investigation.

AUTHOR CONTRIBUTIONS

Daniel Valdés and Meagan Sherrington provided substantial contributions to the conception and design, acquisition of data, or analysis and interpretation of data; Daniel Valdés and Meagan Sherrington drafted the article or revised it critically for important intellectual content; L. Michael Waters gave final approval of the version of the article to be published; and all authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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PATIENT EDUCATION HANDOUT

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High Blood Pressure and Screening

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WHAT DOES BLOOD PRESSURE MEASURE?

Blood pressure measures the force with which blood pushes against the arteries. Arteries carry blood from the heart to the rest of the body. When your blood pressure is high, it means that your arteries are under increased stress due to a higher pressure pushing against the arterial walls.

HOW IS BLOOD PRESSURE MEASURED?

Measuring your blood pressure is a painless process. A cuff is wrapped around your upper arm and is inflated. The purpose of inflating the cuff is to momentarily restrict blood flow through the upper arm. The cuff is then slowly deflated to allow for normal blood flow through the arm to return. Blood pressure is measured with 2 numbers: the systolic pressure (top number) and the diastolic pressure (bottom number). A normal systolic pressure is below 120 and normal diastolic pressure is below 80.

HOW DO I KNOW IF MY BLOOD PRESSURE IS HIGH?

Many patients with a high blood pressure (hypertension) have no symptoms, which has led to hypertension being commonly referred to as a "silent killer." This is why it is important that you get your pressure checked regularly by a healthcare professional or by using a blood pressure machine at home. If symptoms are present, they can include headaches, chest pain, difficulty breathing, nausea, vomiting, and anxiety.

WHEN SHOULD I GET SCREENED?

If you have not checked your blood pressure at least once during the last year, consider visiting a clinical office or your pharmacy to get a reading. Your healthcare provider may also recommend purchasing an at-home blood pressure machine, which can be found at your local drug store or through your insurance company.

HOW CAN I CHECK MY BLOOD PRESSURE BY MYSELF?

- Rest for a few minutes before sitting straight on a supportive surface with your legs uncrossed and flat on the ground
- Wrap your cuff on your upper arm just above your elbow on bare skin with your arm outstretched in front of you with your palm facing upwards
- Try to measure your blood pressure at the same time every day and take multiple readings a few minutes apart
- Note the date and your readings in a journal that you can bring to your next clinical appointment

WHAT CAN I DO TO LOWER A HIGH BLOOD PRESSURE?

Some of the best ways you can lower an elevated blood pressure and reduce your long-term health risks are to exercise regularly, eat a healthy diet that is low in sodium, limit alcohol consumption, stop smoking, maintain a healthy sleep schedule, and find healthy ways to cope with stress. In addition to these lifestyle modifications, some patients may require medications to keep their blood pressure under control.

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PATIENT EDUCATION HANDOUT

Sunscreen Utilization and Protection

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If there was a way to protect yourself from the most common cancer in the United States, would you do it?

Knowledge about skin cancer and its prevention is one of the most powerful tools to protect yourself from it. The largest organ in the body is the skin, which functions in many ways to protect us from the outside world. It creates a barrier to shield us from infection, injury, dehydration, and more.

The skin has several layers: the epidermis, dermis, and subcutaneous tissue. Cells that make up the epidermis, the most superficial layer of skin, are vulnerable to damage. These cells are called squamous cells, basal cells, and melanocytes. When skin cells are damaged, they can lead to skin cancers such as squamous cell carcinoma, basal cell carcinoma, and melanoma.

WHAT CAN CAUSE SKIN CELL DAMAGE?

Exposure to ultraviolet (UV) radiation increases the risk of developing skin cancer. UV radiation is a type of energy that comes from the sun. It is made up of UVA and UVB rays. UVA rays have been associated with skin aging, while UVB rays can cause the skin to burn. Tanning beds and sun lamps also emit UV radiation. Exposure to UV radiation is the single most modifiable factor that you can adjust to protect yourself. Other risk factors for skin damage include things like having a fair complexion or having many moles, but these are unmodifiable.

WHAT CAN YOU DO TO PREVENT SKIN CANCER?

There are many behavioral changes one can make to decrease the risk of acquiring skin cancer. These changes include wearing sunscreen, UV protective clothing made of a tightly woven fabric, a wide-brimmed hat, and sunglasses.

If you are interested in getting some sun, there is a safe way to do it. Dermatologists recommend using a broad-spectrum—at least 30 SPF—waterproof sunscreen. Both UVA and UVB rays can cause skin cancer, which is why it is important to use a broad-spectrum sunscreen that covers both types. It is also helpful to seek shade when possible, along with avoiding times of peak sunlight from 10 am to 2 pm.

HOW OFTEN SHOULD YOU USE SUNSCREEN?

Sunscreen should be used daily on the face, neck, and body. About 1 oz should be used to cover the entire body; this is equivalent to one shot glass. Sunscreen should also be used in the winter to protect against UVA.

HOW SHOULD YOU APPLY SUNSCREEN?

Sunscreen should be applied evenly onto the skin using gentle circular motions 15 to 30 minutes before sun exposure. If the sunscreen is a spray formula, it can be sprayed onto the skin, then rubbed in. Be sure to apply sunscreen to the face, torso, arms, legs, neck, back of the hands, hairline, ears, scalp, and other overlooked places. The lips can also be protected from the sun using a lip balm containing SPF.

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Understanding Childhood Cancers

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This handout provides essential information about childhood cancers, including types, causes, symptoms, diagnosis, treatment options, and prevention.

TYPES OF CHILDHOOD CANCERS

The most common types of cancers that develop in children include:

- Acute leukemias (blood cancer)
- Lymphoma, including Hodgkin and non-Hodgkin (cancer of the lymphatic system)
- Retinoblastoma (cancer of the eye)
- Sarcoma (bone and soft-tissue cancer)
- Central nervous system tumors (cancer of the brain and spinal cord)
- Wilms tumor (kidney cancer)
- Thyroid cancer
- Ovarian tumors
- Neuroblastoma (cancer that forms in an early form of nerve cells)

CAUSES AND RISK FACTORS

- Genetic conditions
- Immune deficiency syndromes (inadequate immune response to infection resulting in susceptibility to infection)
- Family history
- Exposure to radiation or certain chemicals
- Secondary cancer can develop in survivors of retinoblastoma

SIGNS AND SYMPTOMS

Signs and symptoms can vary depending on the type of cancer. Although one symptom alone does not suggest cancer, the combination of persistent symptoms is important to be mindful of. It is essential to consult a healthcare professional for evaluation if your child is experiencing any of these symptoms.

- Fever that follows an unusual course or does not respond to appropriate therapy
- Unexplained weight loss
- Bone pain
- Fatigue
- Bruising or unusual bleeding
- Unusual lumps or swelling
- Changes in vision
- Persistent headaches, often with vomiting

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DIAGNOSIS AND TREATMENT

Although childhood cancers are rare, they can occur in numerous parts of the body. Treatment is more effective when diagnosed early, and the 5-year survival rate increases significantly.

Treatment for childhood cancers is dependent on the type, stage, and location of the cancer.
Common treatment options include:

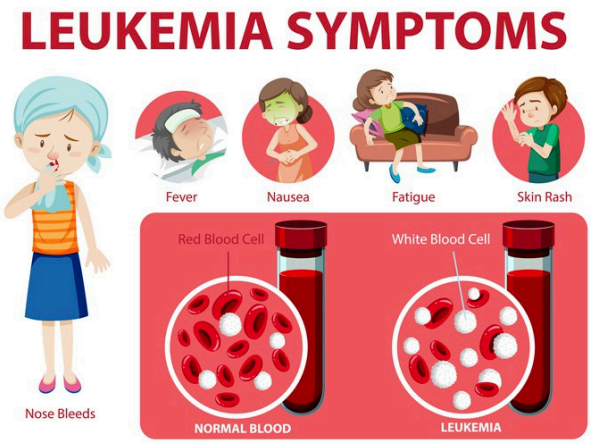
- Surgery
- Chemotherapy (medication that helps to kill cancer cells)
- Radiation therapy (using radiation to treat cancer)
- Immunotherapy (boosting the immune system to help a person's immune system fight off the cancer)
- Stem cell transplantation (taking healthy blood-forming cells and putting them into a patient's bloodstream to help them grow new blood cells)

PREVENTION

Although not all childhood cancers are preventable, certain things can improve overall well-being, such as:

- Minimizing exposure to environmental toxins (ie, tobacco and harmful chemicals) and sun exposure (apply sunscreen, dress in protective clothing, limit exposure during peak hours)
- Ensuring regular doctor checkups to ensure early detection
- Maintaining a healthy lifestyle with diet and exercise
- Genetic counseling if there is a family history of cancer

Please contact your osteopathic family physician if you have any questions or concerns.



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Travelers' Diarrhea

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WHAT IS TRAVELERS' DIARRHEA?

Travelers' diarrhea is a condition related to the ingestion of contaminated food or water, which commonly occurs after traveling to another country. It is the most common travel-related illness and is commonly caused by a bacteria called ETEC (enterotoxigenic *Escherichia coli*) that contaminates local food and water sources. Travelers' diarrhea occurs in approximately 20% to 60% of travelers to low-income regions of the world, as there is a larger risk of eating and/or drinking contaminated items. The symptoms of travelers' diarrhea typically begin within the first week of arrival; however, symptoms can occur any time during travel, even after returning home. The symptoms typically subside within 5 days without treatment.

WHO IS AT RISK?

Anyone traveling to another country could be at increased risk of contracting travelers' diarrhea. High-risk locations are indicated in blue on Map 1 (right) and include Asia, the Middle East, Africa, Mexico, Central America, and South America.

MAP 1. High-risk regions for contracting travelers' diarrhea

Map 1 created by authors using Microsoft Excel.

WHAT ARE THE SYMPTOMS?

Symptoms can include large amounts of loose-to-watery diarrhea occurring at least 3 times within a 24-hour period. Symptoms can also include nausea, vomiting, abdominal pain, abdominal cramping, or fever (>100.4°F).

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PREVENTION

One of the best ways to prevent travelers' diarrhea is to avoid tap water while in high-risk areas. It is recommended to drink beverages from sealed containers and to avoid ice as well. You should not eat raw fruits and vegetables that have not been washed in clean water. If you are unable to find a clean water source, you should boil water before using it. It is important to frequently wash your hands before and after meals. If you have had travelers' diarrhea before or are traveling to a high-risk area, you can discuss medication prevention options with your doctor prior to your trip.

TREATMENT OPTIONS

Travelers' diarrhea will usually resolve within 3 to 7 days without any treatment. You should drink lots of water and electrolytes (bottled water, bottled Gatorade, or some other electrolyte replacement) to replace lost fluids. Antibiotics are not usually used for prevention or treatment. You should seek medical attention if you have a fever over 102°F, bloody stools, signs of severe dehydration (feeling unusually tired, confused, dizzy or lightheaded, not urinating for over 8 hours, passing out), or vomiting that does not stop.

INTERESTED IN LEARNING MORE?

You can find additional information on the CDC (Centers for Disease Control and Prevention) website as well as the StatPearls reference sheet. Both links are included below.

- https://wwwnc.cdc.gov/travel/page/travelers-diarrhea
- https://www.ncbi.nlm.nih.gov/books/NBK459348/

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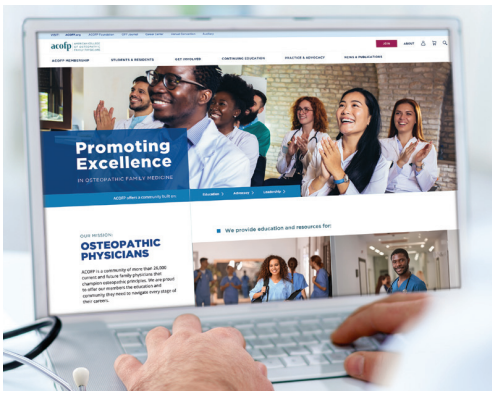

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