Assessing Ideal Body Weight for Children
Carlton K.K. Lee, PharmD, MPH, FASHP, FPPAG
Clinical Pharmacy Specialist, Pediatrics

Assessing ideal body weight (IBW) is a necessary metric used for calculating adjusted body weight and drug dosages of certain medications in obese children and adults. Currently, there are three commonly used methods to assess IBW for children: the McLaren, Moore, and Body Mass Index (BMI) methods. All three methods require gender specific growth charts. Each method’s minimum age is dependent on the minimum age represented on the corresponding growth chart employed. The minimum age is 2 years for stature-for-age and weight-for-age percentiles and 3 years for body mass index-for-age percentiles.

Specific calculation methods are described below:

**McLaren Method**: assumes weight to height ratio is constant
- Required growth chart: stature-for-age and weight-for-age percentiles charts
- Boys: [https://www.cdc.gov/growthcharts/data/set1clinical/cj41c021.pdf](https://www.cdc.gov/growthcharts/data/set1clinical/cj41c021.pdf)
- Girls: [https://www.cdc.gov/growthcharts/data/set1clinical/cj41c022.pdf](https://www.cdc.gov/growthcharts/data/set1clinical/cj41c022.pdf)
- Steps:
  1. Plot child’s stature.
  2. Draw a horizontal line from child’s stature to the 50th percentile stature-for-age line.
  3. Extend a vertical line from the point on the stature-for-age line to the corresponding 50th percentile stature weight-for-age line. This is the IBW.

**Moore Method**: assumes similar height and weight percentiles
- Required growth chart: stature-for-age and weight-for-age percentiles charts (see above)
- Steps:
  1. Determine the child’s stature-for-age percentile.
  2. Find the weight-for-age that is the same percentile as the patient’s stature for age. This is the IBW.

**Body Mass Index (BMI) Method**:  
- Required growth chart: body mass index-for-age percentiles
- Boys: [https://www.cdc.gov/growthcharts/data/set1clinical/cj41c023.pdf](https://www.cdc.gov/growthcharts/data/set1clinical/cj41c023.pdf)
- Girls: [https://www.cdc.gov/growthcharts/data/set1clinical/cj41c024.pdf](https://www.cdc.gov/growthcharts/data/set1clinical/cj41c024.pdf)
- Steps:
  1. Determine the child’s 50th percentile BMI for age and gender.
  2. IBW = [BMI at 50th percentile for child’s age x (child’s height in meters)]^2

There is no consensus on which is the correct method for calculation of IBW; however, there is extremely good correlation among these methods for patients up to 18 years of age who are at the 50th percentile for height. All three methods provide similar results across all percentiles for children under 8 years old. Discrepancies among the methods are greatest at heights farthest from the 50th percentile (3rd and 97th percentiles) and at older ages. The BMI method is preferred for children who are too tall for the McLaren method because using the Moore method in these children may overestimate IBW.

Use of IBW can also be considered in drug dosing for underweight patients. In a recent evaluation of body weight and initial insulin glargine dosing in newly diagnosed pediatric diabetics, the McLaren IBW method, compared to Moore and BMI methods and admission body weight, resulted in better dosage outcomes for patients with BMI-for-age less than the 5th percentile. Nevertheless, additional studies are warranted.

(Continued on page 2)
Ibrutinib and the Risks of Bleeding
Sheetal Patil, PharmD
Clinical Pharmacist, Weinberg Oncology Pharmacy

Bruton tyrosine kinase (BTK) is an important component of the B-cell receptor signaling pathway. BTK contributes to the proliferation, survival, migration, and homing of normal and malignant B cells. BTK also plays a role in impaired platelet aggregation, though the precise mechanism is unknown. Ibrutinib, an oral BTK inhibitor approved for use in B-cell lymphomas such as chronic lymphocytic leukemia and mantle cell lymphoma, was associated with increased risk of major bleeding in early clinical trials. In patients with a congenital absence of functional BTK, such as X-linked agammaglobulinemia, increased rates of bleeding are not noted. This suggests that bleeding associated with ibrutinib therapy may be more complex than BTK inhibition alone.² A recent systematic review and meta-analysis of 22 published trials, including observational studies and randomized controlled trials (RCTs), attempted to estimate the risk of overall and major bleeding events among patients treated with ibrutinib compared with alternative treatments such as rituximab, bendamustine, or ofatumumab.

Seventeen studies described major bleeding in patients receiving ibrutinib with a pooled incidence of 2.76 per 100 patient-years (95% CI 2.07-3.53), while four RCTs show a pooled incidence of 1.9 per 100 patient-years (95% CI, 1.1-2.8) in patients receiving alternative therapies. The pooled incidence of overall bleeding in patients on ibrutinib was 20.8 per 100 patient-years as reported by 13 articles, compared to the pooled incidence of 11.6 per 100 patient-years in patients receiving alternative therapy. Finally, the pooled relative risk of any bleeding with ibrutinib use was 2.72 (95% CI, 1.62-4.58; p = 0.0002).

During clinical trials, patients on concurrent warfarin therapy were later excluded due to higher occurrences of bleeding. Thus, risk versus benefit must be considered for patients on anticoagulant therapy. Patients requiring dual antiplatelet therapy after percutaneous coronary intervention have also shown clinically significant bleeding. For this, the ibrutinib package insert (PI) recommends a dose reduction by one tablet. Effects on disease outcomes and risk of subsequent bleeding events are unknown. In cases of major bleeding, ibrutinib should be withheld until bleeding has resolved. Resumption is at the discretion of the provider. For patients undergoing invasive procedures or surgeries, the PI recommends interruption of ibrutinib for at least three to seven days pre- and post-surgery depending on the type of surgery and the risk of bleeding. In patients with other concurrent therapies, drug interactions with CYP3A4 inhibitors should be avoided as ibrutinib concentrations may increase.³

The systematic review by Caron et al. provides moderate quality evidence that ibrutinib increases overall bleeding compared with alternative treatments, but it did not show a clinically significant difference in major bleeding. While the mechanism is unknown, both disease and therapy related dysfunction may contribute to the increased risk of bleeding with ibrutinib. Benefits and risks of bleeding must be considered with ibrutinib.

References:
1. Imbruvica (Ibrutinib) package insert. Sunnyvale, CA USA: Pharmacyclics, Inc; 2015.

Assessing Ideal Body Weight for Children
(Continued from page 1)

Advantages and disadvantages of each method:⁹

<table>
<thead>
<tr>
<th>IBW Method</th>
<th>Advantage</th>
<th>Disadvantage</th>
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<tbody>
<tr>
<td>McLaren</td>
<td>No calculation, only growth chart</td>
<td>Unable to accommodate taller children (&gt;163 cm for girls and &gt;177 cm for boys)</td>
</tr>
<tr>
<td>Body Mass Index</td>
<td>BMI growth curves contain populations representative of the United States population Method carries through adulthood</td>
<td>Calculation required</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>IBW Method</th>
<th>Advantage</th>
<th>Disadvantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moore</td>
<td>No calculation, only growth chart</td>
<td>Not practical for children &gt;97th and &lt;3rd percentile for height</td>
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<tr>
<td></td>
<td>Accommodates taller children</td>
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<tr>
<td></td>
<td>(&gt;163 cm for girls and &gt;177 cm for boys)</td>
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References:
How clean is clean? At home, my mother says to wash my hands with soap and warm water long enough to sing the Happy Birthday song. In a restaurant, signs are posted stating that employees must wash their hands before returning to work. In a hospital, however, a little more than hand-washing is needed to ensure cleanliness and sanitation. To help with this issue, the Central Pharmacy has added the Clorox Healthcare Optimum-UV System® to their cleaning routine. This disinfection system uses ultraviolet lights to eradicate bacteria that normal cleaning supplies cannot. The Clorox Healthcare Optimum-UV System® works to eliminate healthcare-associated pathogens such as Clostridium difficile, methicillin-resistant Staphylococcus aureus (MRSA), and vancomycin-resistant Enterococcus (VRE).

Ultraviolet light is a form of light that is invisible to the human eye. It has the distinct characteristic of having specific wavelengths between 200 and 300 nanometers, categorized as "germicidal" (UV-C). At these wavelengths, the light is capable of inactivating or killing microorganisms, such as bacteria, viruses, and protozoa. This process is formally known as "ultraviolet germicidal irradiation" (UVGI), and it uses the UV light to destroy nucleic acids, which disrupts the DNA and leaves them incapable of reproduction.

In the Central Pharmacy, Optimum® is situated in the clean and anterooms and left to run 5-minute cycles. The user has 45 seconds to exit the room to avoid prolonged exposure, which can lead to skin and eye problems (e.g. erythema).

Optimum® is the Central Pharmacy's safeguard against microorganisms that may negatively impact patients and helps to ensure that patients receive the best care.

Implementation of The Johns Hopkins Outpatient Pharmacy Drug Take-Back Program

Soumya Vishwanath, Mercer University College of Pharmacy, PharmD Candidate 2019
Kris Rusinko, PharmD, MBA, M.Ed
Assistant Director, Innovation and Operations, Johns Hopkins Outpatient Pharmacy

According to the DEA's National Drug Threat Assessment of 2016, the number of deaths associated with controlled prescription medications, including drug overdose, has surpassed the number of deaths associated with cocaine and heroin combined. Commonly abused drugs include opioids and ADHD medications. Reasons behind the increase have been attributed to easier access to prescription drugs from friends and family members as well as a lack of accessible and safe disposal options. As a result, the DEA passed a resolution in 2014 allowing certain registrants to serve as collection sites for unwanted prescription drugs from end users. Since this resolution, community pharmacies have started serving as collection sites. Beginning in August 2017, the Johns Hopkins Outpatient Pharmacy served as the first collection site within a health system in the state of Maryland.

The Drug Take-Back program will provide a method for patients to dispose of their expired or unwanted medications. Drug receptacles will be installed at five different Johns Hopkins Outpatient Pharmacies including Monument Street, Johns Hopkins Outpatient Center, Weinberg, Arcade, and Bayview. The locations were selected based on regulatory requirements, monitoring capabilities, and patient demand. The receptacle accepts controlled and non-controlled prescriptions, as well as over-the-counter products in various formulations including pills, ointments, creams, and liquids less than 4 ounces. Contents will be sent to a reverse distributor for destruction. Pharmacy personnel received education about the program throughout July and will promote the service to patients in the coming months.

The goal of this program is to provide an accessible avenue for patients to safely dispose of their unused and expired medications and to reduce the possibilities of drug diversion. With the rise in overdose and prescription abuse cases along with Maryland's statewide emergency on opioid abuse, we believe this program will serve as a long-term, user-friendly resource for patients.

References:
To Text or Not To Text: Communicating Medication Orders in the Digital Age
Danyae Lee, PharmD, PGY2 Medication-Use Safety Pharmacy Resident

Text messaging (texting) has emerged as one of the foremost means of communication. In 2010, it was reported that 72% of North Americans were actively using text messaging.1 Furthermore, United States mobile customers sent more text messages than they made phone calls between 2009 and 2011.2 Naturally, the integration of this communication modality has begun to shape the way we convey information. This change is evident by its diffusion into and impact on healthcare and health systems. For example, one study found that 57% of pediatric hospitalists utilized texting for clinical communications.3

When providing and optimizing patient care, timely communication is of the essence. Poor communication has previously been cited as the root cause of delays in patient treatment by The Joint Commission (TJC).4 The ability to utilize texting technology for medication orders has the potential to not only increase convenience, but also enhance collaboration, efficiency, and quality of care. However, the informality of texting, its ability to bypass clinical decision support systems and documentation, and data vulnerability, poses great concern and debate.

Over the past few years, the position of TJC has oscillated between support and, lack thereof, for sending medication orders via text. Concerns for security regarding texting platforms and insufficient sender identity verification mixed with documentation barriers shaped TJC’s stance in 2011.5 Last year, TJC reversed their decision and began to support the texting of medication orders due to the development of secure texting platforms that included: sign-in processes, encrypted messaging, delivery and read receipts, date and time stamps, policies on documentation, and message retention.5 However, the approval only lasted six months. In December 2016 at the request of the Institute of Safe Medication Practices (ISMP), TJC has once again prohibited the text messaging of orders regarding safety issues.6

Texting is considered an informal means of communication by many individuals, comprised of free text and often abbreviated terminology. This can present unique and specific challenges to healthcare, an industry already plagued by transcription errors and error-prone abbreviations. Medication or patient name misspellings enabled by free text and/or improper use of abbreviations combined with unintended autocorrection could increase the potential for error.6 Examples of errors due to confusing medication orders reported to ISMP can be found in Table 1.6

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Actual Order</th>
<th>Intended Meaning</th>
<th>Confusion or Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>2day</td>
<td>Slowmag [sig] 64 mg TID 2day</td>
<td>today</td>
<td>for 2 days</td>
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<tr>
<td>b/4</td>
<td>Carafate 1 g PO b/4 meals and hs</td>
<td>before meals and at bedtime (4 doses)</td>
<td>with 4 meals and at bedtime (5 doses)</td>
</tr>
<tr>
<td>MT</td>
<td>After bag MT, 100 mL/h</td>
<td>empty</td>
<td>Order too ambiguous and had to be clarified</td>
</tr>
</tbody>
</table>

Per the Johns Hopkins Hospital (JHH) Medication Orders policy, “under no circumstance shall medication orders be communicated with the use of notes, texting, or instant messaging.” Orders may only be communicated by three means: 1) entered electronically; 2) written on an approved JHH order form; or 3) verbally.8 As verbal orders are prone to error due to transcription and input issues, the latter is the last line option.

Although the use of computerized prescriber order entry (CPOE) is preferred for communicating medication orders at JHH, it is not without risks. CPOE along with texting, written, and verbal orders have one common thread, human interaction and therefore have the potential for human error. To date, there is not enough information or data to mitigate the security and safety risks to support texting of medication orders.9 Nevertheless, as technology continues to evolve, adoption and utilization increase, and the creation of systems to enhance security and safety arise, the reluctance to text medication orders may diminish. Only time will tell.

References:
The Children’s Health Insurance Program (CHIP) is the largest government sponsored health program for children and is supported jointly by state and federal governments. CHIP was created in 1997 as a complement to Medicaid and provides coverage to over 8 million children, which accounts for approximately 39% of all children in the United States. Since its creation, the number of uninsured children has fallen from 13.9% in 1997 to a record low of 5% in 2016. Funds for CHIP come from state money and matched federal money. The match rate is determined by a formula based on the Medicaid Federal Medical Assistance Percentage (FMAP), which takes into account a state’s per capita income. For each state, the federal government matches Medicaid and CHIP programs at different rates with CHIP benefitting from enhanced federal matching. For example, Maryland’s FMAP for Medicaid programs in the fiscal year 2017 is 50%. However, CHIP is matched at a higher rate of 88%. CHIPs vary state by state, but as a whole are largely credited with improving access to prescription medications, dental care, preventative care including vaccines, and access to care for children with special health needs. States are able to be flexible on determining how to use funds to expand Medicaid, create separate CHIP programs or create combination programs. If a state would like to receive CHIP funding for a separate program, the program must offer benchmark coverage or secretory approved coverage. Benchmark coverage is measured against the coverage offered for state employees or can be measured against the HMO plan with the largest non-Medicaid enrollment for that state. The 2015 legislation that re-authorized the CHIP program also provided funding for health service initiatives that benefit children under the age of 19 who qualify for Medicaid and/or CHIP. In the state of Maryland, CHIP benefits have been used to expand Medicaid to children living below 300% of the federal poverty level and to fund public health initiatives such as the healthy homes for kids program that addresses prevention and treatment programs for lead toxicity and asthma care.

The current federal CHIP funding cycle is set to expire on September 30, 2017. Originally, states were mandated to continue their eligibility levels through 2019 as part of the Affordable Care Act (ACA); however, this is only possible with matched money from the federal government. The Medicaid and CHIP Access Payment Commission (MACPAC) recently recommended that funding be extended for another 5 years. Even though MACPAC is a bipartisan agency and funding for children’s programs has historically been well supported, there are no guarantees in the current congress. Of note, MACPAC’s recommendation is supported by the American Academy of Pediatrics (AAP), who also advocate that all insurance plans offer robust benefits to include a minimum of one in-network children’s hospital, oral healthcare, vision care, and access to prescription drugs in formulations appropriate for children. Additionally, a recent study found children in marketplace plans with comparable benefits to CHIP plans had higher out of pocket costs, especially prescription drug costs.

While the future of the CHIP funding seems uncertain, it is important as healthcare providers that we understand how access to these programs benefit our patients. Although created only 20 years ago, CHIP has contributed to large improvements in healthcare for children.
**Recognitions and Achievements**

**Raymond Lamore, PharmD, BCPS**
Congratulations to Raymond Lamore on being elected as the president of the Delaware Valley Society of Health System Pharmacists (DVSHP)! Dr. Lamore completed both his PGY1 Pharmacy Residency and PGY2 Critical Care Pharmacy Residency at The Johns Hopkins Hospital.

**Suzanne Nesbit, PharmD, FCCP, BCPS, CPE**
Congratulations to Dr. Nesbit on being elected President Elect of the American College of Clinical Pharmacy (ACCP)! Dr. Nesbit’s three-year term begins in October 2017 at the ACCP Annual Meeting in Phoenix, Arizona. She is currently a clinical specialist in pain management and palliative care at JHH. She also holds multiple faculty appointments, chairs the 2017 ACCP Annual Meeting Program Committee and the ACCP-PAC Governing Council, and is an active member of Pain and Palliative Care PRN and the Joint Commission’s Pain Management Technical Advisory Panel.

**Benjamin Iredell, PharmD**
Congratulations to Benjamin Iredell on his appointment to the American Society of Health System Pharmacists (ASHP) Clinical Applications Section Advisory Group! Dr. Iredell is currently completing his PGY2 in Medication Systems and Operations.

**September Birthdays**

<table>
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<tr>
<th>Sun</th>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
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<td>1 Shaz Saadat</td>
<td>2 Addis Yilma</td>
<td>3 Yvonne Molosi</td>
<td>4 Kimberly Greene</td>
<td>5 Orto Townsend</td>
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<td>7 Jovita Harris-Okonkwo</td>
<td>8 Eugene Adjei</td>
<td>9 Koson Vatanaporn</td>
<td>10 Luay West</td>
<td>11</td>
<td>12 Richard Muffoletto, Jr.</td>
<td>13 Alla Aleksyeyenko</td>
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<td>Rowell Villanueva</td>
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<td>Dionne Thorpe</td>
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<td>23 Joanna Jagielska</td>
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<td>25 Pierre Publico</td>
<td>26 Samuel Martin-yeboah</td>
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<td>Christine Nguyen</td>
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Pharmaceutical Rounds
ACPE Accredited CE Presentations
Wednesdays 12:00 - 1:15 PM
Hurd Hall
(Lunch Provided)

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<th>Date</th>
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<tr>
<td>September 6, 2017</td>
<td>“Treating Delirium in Palliative Care: When Antipsychotics are Appropriate”</td>
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<tr>
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<td>Diana Berescu, PharmD</td>
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<td>September 13, 2017</td>
<td>“Exploring New Frontiers in Immunotherapy with Dinutuximab for High-Risk Pediatric Neuroblastoma”</td>
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<td>Lindsay Robusto, PharmD</td>
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<td>September 20, 2017</td>
<td>“Proton Pump Inhibitors and Clostridium difficile Infection”</td>
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<td>Eleanor Danan, PharmD</td>
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<td>September 27, 2017</td>
<td>“Challenges to Developing a Health System Policy for Medical Cannabis”</td>
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<td>Michael Goldenhorn, PharmD</td>
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<td>David Choi, PharmD</td>
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<td>September 27, 2017</td>
<td>“USP &lt;800&gt;: Assessing the Risk”</td>
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<td>Ben Iredell, PharmD</td>
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<td>September 27, 2017</td>
<td>“The Elusive Search for Effective Therapy for Sepsis”</td>
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<td>Jason Kurian, PharmD</td>
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<td>September 27, 2017</td>
<td>“Focus on the Core - Evaluating the Optimal Therapy for Prevention of HBV in Recipients of HBV-Positive Donors”</td>
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<td>Chelsey Song, PharmD</td>
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Pharmacist CE

“Weighing in on Weight Management Medications”
Leslie E. Anforth, PharmD
ACPE Accredited CE Presentation

- **September 11, 2017**
  12:00 PM - 1:00 PM
  Zayed 2117
  (Lunch provided)

- **September 13, 2017**
  7:00 AM - 8:00 AM
  Osler 106

- **September 19, 2017**
  3:00 PM - 4:00 PM
  Zayed 6105

Technician CE

“Mommy, Me, and Methadone? Evaluating Methadone’s Role in Pregnancy”
Candace Essel, PharmD, BCPS
Vivian Ukegbu, PharmD, BCPS

- **September 19, 2017**
  12:00 PM - 1:00 PM
  Miller’s Research Building, G-03
  (Lunch provided)

- **September 26, 2017**
  3:00 PM - 4:00 PM
  Osler 106

Pharmacy Ground Rounds

“Drug Pricing”
Gerard Anderson, PharmD
ACPE Accredited CE Presentation

- **September 14, 2017**
  3:00 PM - 4:00 PM
  Hurd Hall