Letters to the Editor

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The Small-For-Date Infant: A Romance

To the Editor.—

At Walter Reed I was most fortunate to see
Many twins and small infants of great variety.
Observing and caring for these infants of low birth weight
Led to the cartoon concept of the Small-For-Date.[1]
Ancient Harvey noted gestational ages to survive as necessary,
And Clifford had described placental dysfunction and postmaturity.
Wilburt Davison of Duke had been a one kilogram premature,
Yet the early hardships expected of such he did not endure.
Harry Gordon insisted survival depended upon length of gestation
And that all signs of maturity and function we should question.
Ogden Bruton, as well, noted excessive emphasis was placed on weight
And suggested chasing causes of small babies would be my fate.
As a teaching tool the small-for-date cartoon was designed
To encourage others to study small babies, new causation to find.
Smoking and alcoholic use as causes were not known to me,
Nor that my fate was to teach and practice in Kentucky (Alcohol and tobacco are the major products)
Although scientifically interested in blood volume and height,
I also neglected to mention influence of altitude on birth weight.
I have since tried with physical observations, physiology, biochemistry,
Body fluids, amniocentesis, and ultrasound to determine maturity.
Terms were advanced for appropriate, small, or large for gestational age.
And more recently intrauterine growth retardation has come into usage.
That the concept is still felt of use in its fourth decade,
Pleases me that a small part in the concept I played.
The need to understand influences on growth and development
Made the many efforts of others and my own well spent.
All certainly is not known; there is yet much work to do.
The search for me became a career goal and a romance, too.

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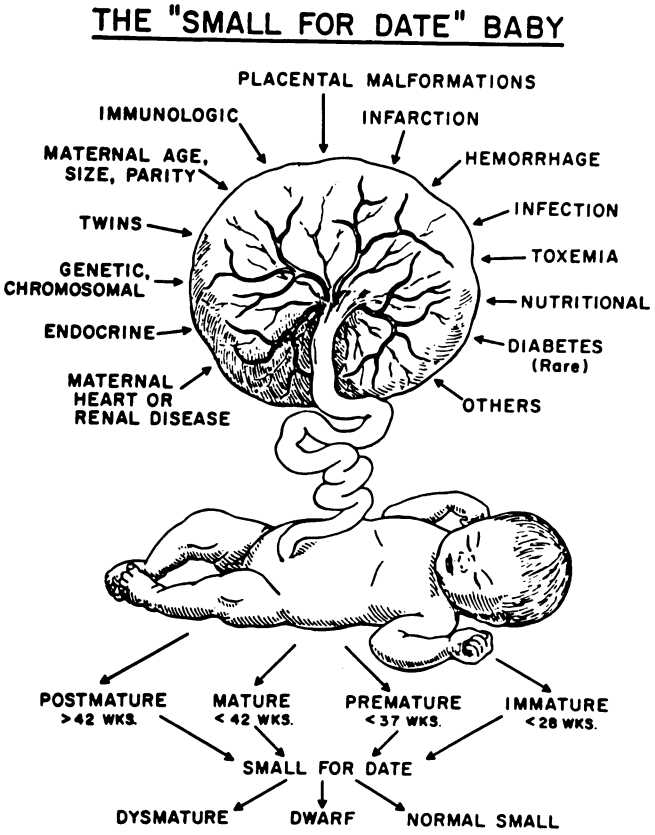

Figure. The small-for-date infant.

Universal Versus Selective Screening for Lead in Children

To the Editor.—

In his commentary in the February 1994 issue of *Pediatrics,* Dr Harvey recommends selective screening for lead in children based on the lack of evidence that a blood lead (BPb) level <20 µg/dL leads to important consequences if not remediated and that the prevalence of BPb >10 µg is too low to justify universal screening.[1] We agree that all screening programs should be continually evaluated so that timely refinements can be made. Such evaluations should be based on a fair representation of all available evidence. Unfortunately, readers were neither presented with nor directed to a substantial amount of literature that is at variance with Dr Harvey's contentions.

Goyer has recently reviewed published studies to date on lead poisoning in children.[2] Although he acknowledges that some of the evidence is contradictory, taken together, the studies demon-

strate a dose-dependent adverse effect of lead on the cognitive and neurobehavioral development of the fetus, infant, and child. These effects are seen even at the 10 to 15 μg/dL BPb level.

Dr Harvey contends that the effect on neurobehavior or intelligence of interventions designed to lower BPb in the 10 to 20 μg/dL range has never been evaluated. Although we agree for his call for cost-benefit studies, the reader should also know that such interventions do result in reductions in BPb levels as noted in the studies reviewed by Dr Harvey himself. Additionally, the findings of Bellinger et al suggest that neurobehavioral and language problems are likely to persist beyond 57 months of age if postnatal lead levels remain elevated.[3] More importantly, they observed that these developmental differences disappeared among children who experienced reductions in their BPb levels.

The deficits in neurobehavior or intelligence reported in some studies are small, on the order of four to seven IQ points, for example.[4] It is tempting to conclude that this decrement is clinically insignificant and therefore of little benefit to the public at large. However, one can begin to appreciate the potential impact of small IQ reductions if the community rather than the individual is considered. As Goyer has pointed out, by shifting the curve to the left among high BPb children the prevalence of severe deficits is increased fourfold while the number of superior children decreases 5%.[2] This point is well captured by Mushak when he asks, "If a substance exacts a toll of millions of IQ points across a population within which individuals have a modest IQ decrement, how does this translate into impairment of the group?"[5]

Scarce resources should indeed be channeled to those who need them. In the case of lead poisoning caution is required, because we are only beginning to come to grips with the breadth and depth of its developmental consequences on children.[5] Targeting populations with economically justifiable prevalences of BPb levels >10 μg/dL implies we are confident that individuals with levels below this will suffer no consequences and therefore need not be identified. Some investigators have demonstrated a dose-dependent BPb effect with no obvious threshold, suggesting there is no safe level.[5] Our ability to detect adverse effects at lower and lower BPb levels is limited at a given point in time by the level of sophistication of the tools used to measure them. The progressive decline in the BPb level defined as toxic is in itself an indicator of our evolving knowledge of lead poisoning.

By lowering the acceptable level of BPb, the Centers for Disease Control and Prevention has essentially lowered the "plumbostat"—that level at which health professionals should intervene.[6] This is of significance because a 1- to 2-year-old who might have gone on to higher cumulative lead levels with potentially damaging consequences is followed more closely by retesting to ensure that the BPb is in fact coming down. One might argue that for the BPb screening efforts to be truly preventive, monitoring should begin well before the current "plumbostat." In this way youngsters with rising BPb would be identified before potentially injurious levels are reached.

We do not disagree with Dr Harvey's call for selective screening. Incorporating the Centers for Disease Control and Prevention questionnaire or its modifications should be part of the screening process. With experience and a stable patient population, one could use a questionnaire to identify those at risk. On the other hand, if the practice base has a relatively high turnover, the predictive properties of such a questionnaire could vary with time. It is not clear how much of a problem this would be when there is concomitant high geographic mobility. At the very least, we need to address these and any other issues before accepting selective screening. In the meantime, pediatricians, family physicians, obstetricians, and other involved professionals can have a significant impact on this problem by educating parents (and prospective ones) about the importance of preventing lead poisoning.

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In Reply.—

Kawatu et al state that effects of lead on cognitive and neurobehavioral development in children may be seen at the 10 to 15 μg/dL blood lead (BPb) level, and they note that I did not cite many articles supporting a dose-dependent adverse effect of lead. Since I granted in my commentary that there may be an effect at BPb levels even below 10 μg/dL, I felt it unnecessary to cite many articles supporting this premise. The question is, at low BPb levels, are there important consequences for the *individual* child? The arguments of Kawatu and colleagues, as well as those of the authors they cite, support the contention that lowering BPb levels for most children is of *societal* importance primarily and that, as they say, "one can begin to appreciate the impact of small IQ reductions if the community rather than the individual is considered."

As to effects on the *individual* child, two of the best longitudinal studies clarify Kawatu's mention of four to seven IQ points lost. Baghurst et al[1] found BPb of 30 μg/dL at ages 2 to 3 to result at age 7 in an IQ about five points lower than that of children who had had BPb of 10 μg/dL at ages 2 and 3. Bellinger[2] compared BPbs of 20 μg/dL and 3 μg/dL at age 2 with intelligence at age 7 and found a six point IQ point difference. Thus, starting at relatively high levels and lowering BPb by 10 μg/dL at age 2, if the lower level persists, may save as much as a three IQ points. This limited analysis oversimplifies a complex issue, but less so than Kawatu's conclusion of a four to seven point IQ loss.

Another issue raised by Kawatu et al concerns the effect of interventions that reduce initial BPb levels that are below 20 μg/dL. They state that "such interventions do result in reductions in BPb levels as noted in the studies reviewed by Dr Harvey himself." They failed to note that the article by Kimborough to which they refer[3] included children with BPb as high as 40 μg/dL, that it was an uncontrolled study, and that the authors commented that the decrease might be related to age. Another possible reason for the decrease might be a regression of BPb values toward the mean. Without a control group, the study is interesting, and—as the authors themselves state—the findings are only suggestive. One would hope that such studies would pique the interest of lead investigators in performing controlled studies before suggesting a universal implementation policy.

It is worth noting that each family in the Kimborough study had a 30- to 45-minute visit for education and counseling. Future studies should evaluate not only the clinical impact on individual children, but also the societal impact, if any, and the cost of changes, if any, in BPb level. Only with such information can informed, intelligent decisions about intervention at BPb levels <20 μg/dL be made.

A further issue raised by Kawatu et al is multiple screenings to identify children with rising BPb values. They imply that repeated testing of all children no matter how low the initial BPb will be valuable in identifying such children. Rather than utilizing our resources for recurrent BPb testing of all infants and children, the overwhelming majority of whom have BPb <10 μg/dL, we might better use our resources to remove lead from environments in which children live or to address other pressing child health issues. Until we have some idea of the relative costs and benefits of repeated BPb tests on all children and of intervention efforts in