

## The Brain Death Debate: A Methodological Analysis – Part 1 (Yoma Passage) by Daniel Reifman

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At the end of last year, the Halakha Committee (Vaad Halakha) of the Rabbinical Council of America released an educational paper which opposed the halakhic recognition of brain death, bringing the long-simmering debate over this issue to a boil once again. The paper is most directly a belated response to the RCA Executive Committee's acceptance in 1991 of the Health Care Proxy authored by Rabbi Moshe Dovid Tendler, a move opposed by a majority of the Vaad Halakha at the time.<sup>[1]</sup><sup>[1]</sup> But the debate over the halakhic status of brain death stretches back nearly two decades earlier, when the tragic case of Karen Ann Quinlan first brought the question of how to define death to national attention. The issue, then, has been the subject of halakhic dispute for almost forty years, yet it continues to occupy a central place in the public consciousness, as the RCA paper—weighing in at over a hundred pages of dense analysis—amply demonstrates.

To the layperson, it may seem frustrating that the rabbinate cannot reach a consensus about such a basic issue as when life ends, but it's only appropriate that a matter of this gravity be subject to a prolonged and intense evaluation. Witness how even within the medical community, a steady stream of new data about brain death has forced doctors to revise clinical procedures, and in some cases even question long-accepted standards. What is unfortunate about the halakhic debate is the way it has acquired a rather polemical tone: even when disputants' intent is *le'sheim shamayim* (for the Sake of Heaven), the impulse to promote their position can lead them to make exaggerated claims or neglect to address contrary evidence. One wishes for an assessment that acknowledged the genuine ambiguity inherent in some of the sources, or conceded that regardless of where one draws the line between life and death, there will always be some cases that defy simple classification.

When I began preparing to teach my first course on Jewish medical ethics, I was inclined to believe that there was enough uncertainty on the issue of brain death to render it halakhically unacceptable. My subsequent research gradually convinced me that one could make a compelling case for a halakhic standard of brain stem death. First and foremost, then, the goal of this series of posts is to articulate a response to the RCA paper, which comes down squarely against that view.

But I also hope to forward the halakhic discussion of brain death on two other fronts. The first is simply to promote a more methodologically conscious style of analysis. The polemical tenor of the debate has often led to sources being cited as unequivocal support for one side or the other without a full accounting of how those sources are being understood. We need to develop a more heightened awareness of the hermeneutic process—an understanding that texts do not simply 'read themselves', that sources and data invariably present multiple interpretive possibilities—and we need to be both more self-conscious and more transparent about the reasons we reject some interpretations and accept others. There is, of course, nothing terribly innovative about such an approach: to read a well-crafted responsum is to see the painstaking care with which a *posek* weighs a number of potential readings of a particular passage before arriving at a final, authoritative interpretation. But without the weight of a *posek's* mantle on one's shoulders, the self-conscious mode of analysis I have described leads one to view meaning in terms of greater and lesser possibilities rather than firm conclusions. One learns to accept the fact that no one interpretation can lay an exclusive claim to truth, and that the best one can do is to build a case for one's analysis that others will find convincing.

Second, the early stages of any halakhic debate are marked by a tendency to cast a wide net for relevant sources. This is particularly true regarding halakhic questions that stem from modern technology, where traditional sources can be brought to bear on the issue only indirectly. By now the debate over brain death has moved past this initial period of development. The basic arguments on both sides have crystallized; new studies only attest to the fact that we have reached the point of diminishing returns. To wit, the RCA paper is the first major report on this issue to emerge in several years, and while it incorporates some recent medical data, most of the halakhic analysis it offers has already been published elsewhere, most of it well over ten years ago.<sup>[2]</sup><sup>[2]</sup> At this stage, we should be able to distinguish those sources and issues that are truly pivotal from those that—though potentially relevant—end up creating more questions than they resolve. I hope through this series of posts to narrow the focus of the debate, so that even if the issue remains unresolved (and it would be naive to assume otherwise), we can agree at least what exactly it is that we disagree about.

There is, of course, already an extensive secondary halakhic literature on brain death, so that much of the material I will present is based on what others have written. However, in an effort both to keep these posts accessible to a wide audience and to avoid the kind of polemical tone I referred to above, I will largely avoid direct references to this literature in the body of the text. The reader who wishes to research this topic in greater depth is directed to the footnotes, where I will refer to articles by some of the major proponents of both pro- and anti-brain death positions.

### I. The Talmudic Passage in Yoma (85a) and Rashi's Commentary

Virtually all halakhic authorities concur that this is the *sugya* (Talmudic passage) most relevant to the question of how death is defined in Halakha.<sup>[3]</sup><sup>[3]</sup> The mishnah addresses a case in which people may be trapped beneath the rubble of a fallen building on Shabbat, and rules that we continue digging as long as there is any chance of finding a live victim. The gemara addresses the issue of assessing whether a victim is alive once he is found. The text from the standard Vilna edition reads as follows:

תנן רבנן: עד היכן הוא בודק? עד חוטמו, ויש אומרים: עד לבו...

נימא הי תנאי כי הי תנאי, דתנאי: מהיכן הולד נוצר – מראשו, שנאמר "ממעמי אתה גוזי" ואומר "גזי נוצר והשליכי"; אבא שאול אומר: מטיבוח, ומשלח שרשוי אילך ואילך. אפילו תימא אבא שאול: עד כאן לא קאמר אבא שאול התם אלא לענין יצירה, דכל מידי ממציעתיה מיתצר, אבל לענין פקוח נפש – אפילו אבא שאול מודי דעקר חיותא באפיה הוא, דכתיב "כל אשר נשמת רוח חיים באפיו".

אמר רב פפא: מחלוקת ממטה למעלה, אבל ממעלה למטה, כיון בדק ליה עד חוטמו – שוב אינו צריך, דכתיב כל "אשר נשמת רוח חיים באפיו".

Our Rabbis taught: How far does one examine? Until [one reaches] his nose. Some say: Until his heart...

Let us say that these tannaim dispute in the same way as the following tannaim, for it was taught: From where is the embryo formed? From its head, as it is said, "In the womb of my mother, You were my support [*gozli*]" [Psalms 71:6], and it is also says: "Shear [*gozli*] your locks and cast them away" [Jeremiah 7:29]. Abba Shaul says: From the navel, and it sends out its limbs into every direction. You may even say that [the first view is in agreement with] Abba Shaul, for Abba Shaul holds his view only with regard to the formation [of the fetus], because everything is formed from its middle, but regarding the saving of life even Abba Shaul would agree that the essential life force [manifests itself] through the nostrils, as it is written, "All in whose nostrils was the spirit of the breath of life" [Genesis 7:22].

Rav Papa said: The dispute is only [if the victim is uncovered] from below upwards, but if from above downwards, since he checked up to the nostrils, one need not check any further, as it is said: "All in whose nostrils was the spirit of the breath of life".

In the context of the contemporary debate whether death is determined by cessation of respiration or heart function, it seems natural to assume that the initial debate in the gemara is relating to this very issue. The opinion that one must uncover the victim *עד לבו* ("until his heart") holds that one must check to see if his heart is still beating, while the opinion that states that one must uncover him *עד חוטמו* ("until his nose") believes that one must check to see if he's breathing. On closer inspection, however, this interpretation does not stand for several reasons.

First, whereas the phrase *עד חוטמו* can be taken to mean that we check the nose directly, the phrase *עד לבו* cannot be reasonably be taken to mean that we check the heart organ directly; it's obviously referring to an external examination of the chest area above the heart. A more precise translation, then, would translate the term *לב* as *idiomatic*: we uncover "until his chest" rather than "until his heart".

However, once we acknowledge that the term *לב* cannot be taken completely literally, the purpose of uncovering to the chest becomes less clear: we might be checking either for the heartbeat or for the rise and fall of the chest during respiration. One might reasonably argue that the choice of

the term לב indicates not only the extent of the uncovering the victim but also its purpose—we uncover the victim until the ‘heart area’ in order to check for a heartbeat. However, a survey of instances of the term לב in Tannaitic sources shows that in virtually every other context in which it refers to a part of the body (as opposed to a state of mind), it cannot plausibly be explained as having such a dual connotation: לב is always used idiomatically to refer simply to the external chest area, with no connection to the heart organ that lies beneath. Hence the gemara in Moed Katan (26b) cites a beraitha as to whether one in mourning for a parent must rend his clothes *עד טיבו לב*—“until the navel”—or only *עד לב*—“until the chest”. In a similar vein, the gemara in Berakhot (24b-25a) cites the following beraitha regarding the degree to which one must be dressed in order to pray: *לב שכיסה את לבו – אבל לתפלה – מותר לקרות קריאת שמע*, אבל לתפלה – מותר לקרות קריאת שמע, אבל לתפלה – מותר לקרות קריאת שמע. (‘If his garment, whether of cloth or of leather or of sackcloth, is girded round his waist, he may recite the *Shema*, but he may not say the *Amidah* until he covers his chest’). In the mishnah in Sanhedrin 6:4, the phrase *נפך על לבו* means simply “if he turned face down [i.e., on his chest]”. The mishnah in Eruvin 5:4 uses the phrase *לב נגד* to mean “at chest height”. So unless internal evidence from this *sugya* suggests otherwise, there is no reason to assume that the position that requires checking *עד לב* in concerned with cardiac activity *per se*.<sup>[4]</sup><sup>[4]</sup> It’s equally likely that this opinion requires examining the chest as a means of assessing respiratory activity.

Second, if we assume that the debate as to where to uncover the victim reflects a fundamental disagreement over which biological function is the definitive indication of life, we would logically assume that both opinions would apply across the board, regardless of how the victim is found. However, R. Papa maintains that the debate refers only to a case in which the victim is uncovered in a such a way the rescuers reach the torso before the head; if the head is uncovered first, all agree that checking the nose is sufficient. According to this interpretation (which by all accounts is the authoritative conclusion of the *sugya*), the opinion that states that we uncover the victim *עד לב* actually holds that examining *either* the nose or the chest is sufficient, while the opinion that states that we uncover him *עד חוטמו* always requires that we examine the nose. Thus if we insist that the purpose of examining the victim’s chest is to listen for a heartbeat, it would emerge that one opinion holds that death can be determined *either* by lack of respiratory function or by lack of cardiac function, while the other opinion relies only on respiratory function. While this interpretation is certainly possible, it seems more plausible to say that both opinions regard respiratory function as the definitive indicator of life, and disagree only as to whether lack of movement at the chest is a reliable indicator that the victim has stopped breathing or whether one must also verify that there is no nasal airflow.

Lastly, there is the issue of multiple variants in the text of the *sugya*. In contrast to the Vilna text cited above, which follows Rashi’s version, most of the medieval commentators cite a variant which has the words *עד טיבו לב* (“until his navel”) in place of *עד לב*, a variant that is also found in the parallel *sugya* in the Yerushalmi (Yoma 8:5).<sup>[5]</sup><sup>[5]</sup> This text obviously brings the language of the original debate into closer harmony with the language of the debate regarding fetal development to which the gemara compares it, but it also removes any reference to the heart from the *sugya*. Since there cannot be any clinical significance to the navel itself, we are left to our own devices to assess the most likely purpose of examining the abdomen. The simplest explanation seems to be that one is checking for the movement of the diaphragm, both because this is the most obvious movement at the abdomen,<sup>[6]</sup><sup>[6]</sup> and because it avoids creating a fundamental debate about which biological function serves as the indicator of life. It is certainly possible that those who adopt this alternate text have a fundamentally different conception of the debate than does Rashi. But given that the term לב itself doesn’t necessarily refer to the heart organ, there seems to be no reason to assume such a difference of opinion.<sup>[7]</sup><sup>[7]</sup>

**In sum, from the perspective of *peshat* in the gemara, there is no reason to assume that heart function is a factor in determining whether such a victim is alive or dead.<sup>[8]</sup><sup>[8]</sup> Indeed, a close analysis of arguments put forth by opponents of the brain death standard shows that when they cite this *sugya* as support, they invariably point not to the text of the gemara but rather to Rashi’s commentary thereon.<sup>[9]</sup><sup>[9]</sup>**

Rashi explains the final stage of the *sugya* as follows:

הכי גריסין: אמר רב פפא מחלוקת מלמטה למעלה: מחלוקת דהך תנאי, דמר אמר: עד לב, ומר אמר: עד חוטמו, מלמטה למעלה שמוצאו דרך מרגלותיו תחלה, ובדק והולך כלפי ראשו, דמר אמר: בלבו יש להבחין, אם יש בו חיות, שנשמט דופקת שם, ומר אמר: עד חוטמו דדימנן דאין חיות נכר בלבו, וניכר בחוטמו.

This is how the text should read: “The dispute is only [if the victim is uncovered] from below upwards”: The dispute between these tannaim—in which one says [that we examine] “until his heart”, and the other says “until his nose”—[applies only if the victim is uncovered] from below upwards, that they find his feet first and continue examining in the direction of the head. For one says: in his heart one can discern if there is life, since his *neshamah* beats there; and the other says: [we examine] until his heart, for sometimes life is not discernible at the heart, but is discernible at the nose.

Rashi explains that both positions recognize that heart activity could potentially serve as an indicator of life, and differ only as to whether examination of the nose is more reliable, such that examination of the heart alone would not suffice. This suggests that Rashi recognizes cardiac activity as a definitive indicator of life, and the only reason for requiring examination of the nose is that respiration is more easily detected than the heartbeat. According to this line of reasoning, were there to be a situation in which we knew the heart was beating, absence of respiration at the nose (or, presumably, any other physiological symptom) would be insufficient to declare the victim dead.<sup>[10]</sup><sup>[10]</sup>

Given our conclusion above, that within the gemara the term *עד לב* means simply “until the chest”, what would cause us to explain the term *בלבו* in Rashi as meaning ‘within the heart organ’? It seems to me that three factors come into play:

- 1) Rashi’s use of term לב is less obviously idiomatic than the gemara’s. Whereas in the gemara the primary meaning of לב must be the external heart area, i.e. the chest, one can legitimately explain that Rashi is referring to signs of life that are found within the actual heart organ. This explanation is obviously not decisive—one could still translate בלבו as meaning “within the chest” and explain that Rashi, too, is referring to respiration rather than heartbeat. But the shift in context creates enough ambiguity to make either interpretation plausible.
- 2) The phrase *שנשמט דופקת שם* can be explained to refer to the heartbeat. This, too, is not a decisive interpretation: it depends on translating the term *נשמט* as “soul” (i.e., a generic reference to ‘life force’) rather than “respiration” (i.e., *נשימה*=נשימה). Similarly, the term *דופק* may suggest the rhythmic beating of the heart (in line with its usage in Modern Hebrew), though it might also be taken to refer to the regular rise and fall of the chest.
- 3) Our understanding of Rashi is invariably influenced by the history of its interpretation in later sources. As it would happen, Rashi’s commentary plays a prominent role in a famous responsum of Rabbi Zevi Ashkenazi (*She’elat Ve’Teshuvot Hakham Zevi #77*) regarding the importance of the heart. The responsum addresses a case where the heart of a slaughtered chicken could not be located, the question being whether it was possible that the heart was excised before the chicken was slaughtered such that it should be considered non-kosher (as a *safiek tereifah*). The Hakham Zevi dismissed the notion that the chicken could have survived without a heart—meaning that the heart must have gone missing after it was slaughtered—and cites this passage from Rashi to demonstrate “that the seat of the soul is the heart” (*שנשמט משנה בלב*).

An objection that has been raised to this interpretation stems from the fact that Rashi’s understanding of heart function was significantly different than the function ascribed to it by modern medicine. Based on the regnant medical theories of his time, Rashi assumed that the purpose of the heart was to process the air that was drawn into the body. Thus when Rashi refers to heart function as an indicator of life, he is not referring to cardiac function as we understand it—the force behind the circulatory system—but rather to a process associated with breathing. Hence Rashi’s statement that heart function is an indicator of life merely affirms the gemara’s conclusion that we determine whether the victim is alive or dead based on the presence of absence of respiration.

This objection has been articulated most comprehensively by Rabbi Dr. Edward Reichman,<sup>[11]</sup><sup>[11]</sup> a leading scholar of the history of medical Halakha, and his research leaves little doubt that the prevailing medieval conception of the human body provides an accurate context in which to understand Rashi’s position. Comments of Rashi’s from elsewhere in the Talmud conclusively demonstrate that he shared most of the medical assumptions of his time regarding the structure of the body and the functioning of its organs. The same can be said of many other medieval and early modern (pre-18<sup>th</sup>-century) rabbinic authorities, including the Hakham Zevi.

But knowledge of medieval theories of physiology can only take us so far in understanding Rashi’s position. Consider the difference between Rashi’s commentary and a medieval medical textbook. The latter has effectively been confined to the dustbin of history, of interest only to historians of science, having no impact on contemporary medical practice. Rashi’s commentary, on the other hand, retains its full normative force

as an integral part of the halakhic system. This is a key difference between the dynamics of science and of law. The progressive mandate of science renders scientific texts obsolete once they are no longer useful in describing the workings of nature. Law, on the other hand, functions on the basis of a canon of binding prescriptive texts, which often remain in force far beyond the conceptual milieu in which they are written. So in order to assess the meaning of Rashi's statement, we need to understand not just what his words meant in their original historical context but also what they should be taken to mean in an entirely different context. This is not solely a matter of history of medicine, but also a matter of hermeneutics: how should we *translate* Rashi's words into the language of modern medicine?

For translation is essentially what proponents of the brain death standard are doing when they state that for Rashi the heart is really a respiratory organ. They reason as follows: Were Rashi writing in a modern medical framework, he could not have used the term "heart" to refer to all the functions that it referred to in medieval medical context, such as the intake of air into the body; therefore we should translate Rashi's reference to the heart using a term that conveys the most of what Rashi *means* when he refers to the "heart", a term like "respiratory organ". While this translation is certainly plausible, it rests on a number of hermeneutic assumptions that can be called into question. It assumes, for instance, that terms for bodily organs should be interpreted based solely on their function, rather than on their physical identity (the organ that Rashi would have identified as a "heart" is still what we refer to as a "heart"). Moreover, it focuses on only one aspect of what medieval doctors believed the heart to do. Consider the following passage from one of the Rambam's medical treatises that Dr. Reichman himself cites (p. 159):

I have prefaced [my remarks] with this introduction in order to stimulate you to critically appraise a statement of the great sage Galen. You already know that his opinion is that there are three major organs, the heart, the brain, and the liver, and that not one of these can receive its power from another organ under any circumstances. The opinion of Aristotle and his followers is, as you know, that there is a single main organ, namely, the heart, and the heart sends powers to each of the other organs and, with this power, the other organs perform their specific functions. Therefore, according to the view of Aristotle, the heart sends powers to the brain and with this power the brain performs its function, and it in turn gives sensation and movement to other organs. So, too, the powers of imagination, thought, and memory are powers that are brought into existence in the brain through the principle that the brain receives from the heart. Similarly, all other organs in the body contain the powers with which they perform their special functions. This [thesis of Aristotle] is correct and logical because the brain performs its functions, and likewise every organ performs its functions and all together they constitute the total life situation of an individual. However, the heart sends the specific power of life to each organ. [12] [12]

We may not have direct evidence as to whether Rashi ascribed to a Galenic or Aristotelian model of the heart's interaction with the rest of the body. But this passage demonstrates that at least some pre-modern doctors understood that the heart served the function of delivering a crucial life-giving substance to the rest of the body, a substance that Galen considered to be derived from the inhaled air that entered the heart. [13] [13] In modern medical terminology, we refer to this delivery process as "circulation" and this crucial life-giving substance as "oxygen". True, medieval doctors had no conception of the role of blood in delivering this substance, so to refer to the heart in the context of medieval medicine as a "circulatory organ" is to overstate the case. But their understanding of respiration was also vastly different from ours—its main purpose was to cool the "innate heat" of the heart by drawing in cold air, so it's also not completely accurate to refer to the heart as a "respiratory organ" in the modern sense of the term.

If one is to object to the use of this passage from Rashi as support for a cardiac definition of death, it seems sounder to base one's objection on the passage's interpretation history, though in this case the evidence that speaks loudest is who does *not* cite Rashi as a fundamental source. Rashi's commentary to this *sugya* may feature prominently in the aforementioned responsum of the Hakham Zevi, but it is conspicuously marginal in the writings of the two authorities most frequently cited on the issue of brain death: Rabbi Moshe Schreiber (the "Hatam Sofer") and Rabbi Moshe Feinstein. In the relevant responsum (*She'elot Ve'Teshuvot Hatam Sofer, Yoreh Deah #338*), the Hatam Sofer cites the *sugya* in Yoma as his primary source, yet does not refer at all to Rashi's commentary. Likewise, Rabbi Feinstein (*She'elot Ve'Teshuvot Iggerot Moshe, Yoreh Deah #146*) cites Rashi's commentary in Yoma only as a secondary citation from the Hakham Zevi—not as the basis for his own position, and then only to explain why the Hakham Zevi's proof from Rashi doesn't undermine his position. This is not to say that these authorities unequivocally deem heart function to be irrelevant; quite the opposite—as I will argue in later posts, these responsa are sufficiently ambiguous to offer support for both sides of the brain death debate. But to the extent that the Hatam Sofer and Rabbi Feinstein can be interpreted as saying that heart function is a dispositive sign of life, there is little to suggest that Rashi's commentary in Yoma influenced their rulings.

To summarize our analysis thus far: The *sugya* in Yoma strongly suggests that Halakhah determines the moment of death based on the absence of respiration, and regardless of how we understand Rashi's commentary, in point of fact it does not figure as a significant factor in principal later sources. We will examine the positions of the Hatam Sofer and Rabbi Feinstein in more detail in subsequent posts

[1] [14] It should be noted that following the completion of an advanced draft of this essay, the RCA issued a [press release](#) [15] clarifying that the organization does not take an official stand on this matter, in recognition of the contrary positions taken by different halakhic authorities.

[2] [16] Virtually all the halakhic sources that the RCA paper cites from the past decade are oral communications with halakhic authorities confirming or clarifying previously stated positions. Strangely, the paper makes no mention of the one major halakhic development on this issue from the past few years: the support of R. Ovadiah Yosef and R. Shlomo Amar for Israel's Cerebro-Respiratory Death Act, 2008, which officially accepts brain stem death as the standard of death.

[3] [17] A notable exception to this is Rabbi Hershel Schachter ("1994 7 אסיא", "בדיני מת וגברא קטילא", pp. 188-206), who refers to the *sugya* in Yoma 85a only in passing. Instead he bases his ruling largely on the *sugya* in Nazir (21a), a source not mentioned by any of the other authorities who address this topic. Due to the idiosyncratic nature of Rabbi Schachter's analysis, I have chosen not to address it here.

[4] [18] *Contra*. Edward Reichman (*Torah U-Madda Journal* 4 [1993], p. 154), who insists that the simple implication of the term לֵב is the actual heart organ ("It is clearly the heartbeat that is either being palpitated or listened for").

[5] [19] For a thorough analysis of the textual variants to this *sugya*, see Alexander Tal, "Nostrils, Navel or Heart? Significant Textual Talmudic Variations Concerning Signs of Life" (available at [http://www.hods.org/pdf/Nostrils,%20Navel%20or%20Heart\(1\).pdf](http://www.hods.org/pdf/Nostrils,%20Navel%20or%20Heart(1).pdf) [20]).

[6] [21] In theory it is possible to check the pulse at the abdomen. From a practical perspective, however, the abdomen is a far less reliable place to find a pulse than, say, the neck or the ankle (see Reichman, p. 152), so if the opinion that holds that one must examine טִיבוֹ עַד is advocating checking the victim's pulse, it's not clear why he would choose the abdomen as the place to do so.

In general, it does not seem that the gemara is interested in (or even aware of) the use of the pulse as a vital sign. The technique of checking for a pulse was well known in antiquity, but is never referred to explicitly in the Talmud. (ibid.)

[7] [22] Meiri, the only medieval commentator who explicitly refers to both variants, doesn't seem to find the difference in language significant; he speaks of checking for לֵב אוֹ טִיבוֹ אוֹ ("to either his navel or his heart"). (The same is true of R. Moshe Feinstein [*She'elot Ve'Teshuvot Iggerot Moshe, Yoreh Deah #146*] who repeatedly refers to the second opinion in the gemara as טִיבוֹ עַד.) The authors of the RCA paper duly note this fact (pp. 27, 86), but whereas they see it as proof that even the variant of טִיבוֹ could be referring to heart function, the other evidence we cited above suggests the opposite—even the variant of לֵב doesn't indicate that the gemara is referring to the actual heart.

[8] [23] Rabbi Avraham Steinberg concludes as much when he says that "the heart as a criterion for determining the moment of death is not mentioned at all in the Talmud". ("1982 3 אסיא", "היבטים הלכתיים", חלק ב', קביעת רגע המות – חלק ב', p. 406).

However, the authors of the RCA paper defend the notion that the gemara itself relates to heart function by emphasizing the proposed parallel between the initial debate and the debate regarding fetal development. They suggest that Abba Shaul's position that the fetus develops from מִטִּיבוֹ ("from the navel") is referring to the fact that the heart is one of the first discrete organs to develop within the fetus' body. So as to strengthen the parallel between Abba Shaul's position and the opinion that holds we uncover the victim מִטִּיבוֹ עַד, the authors suggest that לֵב עַד must be referring to the actual heart. (pp. 25-6) Based on this they critique R. Steinberg for "fail[ing] to provide a good and clear reading of the גמרא." (p. 86)

This analysis strikes me as forced for a number of reasons: 1) It assumes that proposed parallels between different Tannaic debates are highly precise, an assumption that is difficult to sustain on a Talmud-wide basis; 2) It places a great deal of weight on an intermediate proposal that is quickly rejected, while ignoring evidence from R. Papa's interpretation, which is accepted as authoritative; 3) In order to preserve the literal meaning of the phrase **עד היק**, the authors are forced to sacrifice the literal meaning of Abba Shaul's phrase **עד היק** (מטיבור). It imposes modern medical knowledge on Abba Shaul's position, an issue we will discuss at greater length below (the authors themselves acknowledge this last difficulty).

[9] [24] For example, see J. David Bleich ("Of Cerebral, Respiratory and Cardiac Death", *Tradition* 24:3 [1989], pp. 44-66), who acknowledges that from the gemara itself it seems that all opinions regard cessation of respiration as a reliable indicator of death, but then continues: "This analysis, as attractive as it may be as a literal reading of the Gemara, is contradicted by Rashi in two separate comments." (p. 55)

[10] [25] For example, see Bleich, "Establishing Criteria of Death", *Tradition* 13:3 (1973), p. 95-96.

We should note that Rabbi Bleich ("Cerebral", pp. 55-6) also finds support for a cardiac definition of death in a second passage in Rashi. In describing the case the gemara is addressing, Rashi explains: "אם דומה למת שאינו מזיז איבריו, עד היק הוא מפקח לדעת האמת" ("How far does one examine: If he is like a corpse that does not move its limbs [*eivarav*], until what point to we check to determine the truth?"). Rabbi Bleich notes that elsewhere (Bekhorot 45a), both the Talmud and Rashi use the term *eivarim* to refer to the 248 'limbs' that Rabbinic tradition ascribes to the human body. (Although the figure of 248 limbs is traditionally understood to refer specifically to bones, the term "ever" is often used in Rabbinic literature to refer to other non-osseous organs.) Based on this, if any of the victim's *eivarim*—including his heart—were moving, establishing the absence of respiration would be insufficient to declare the victim dead. Rabbi Bleich reiterates this interpretation in numerous other publications (e.g., "Survey of Recent Halakhic Periodical Literature", *Tradition* 16:4 [1977], p. 136; "Survey of Recent Halakhic Periodical Literature", *Tradition* 22:2 [1986], p. 79; "Time of Death", *Judaism and Healing* [New York: KTAV, 2002] p. 191).

I mention this argument only because Rabbi Bleich seems to find it so fundamental. It's hard to imagine how Rashi expects the rescuers to verify a complete absence of internal muscle movement when they had uncovered (according to one opinion) only the victim's head. Within the context of this *sugya*, it's clear that "*eivarav*" refers simply to the victim's external limbs (as far as the rescuers can discern them), and does not carry a strict technical meaning of all the body's of internal and external organs.

[11] [26] *Op. cit.* (n. 2), pp. 155-6, 158-62.

[12] [27] F. Rosner and S. Muntner, *The Medical Aphorisms of Moses Maimonides*, vol. 2 (New York: Yeshiva University Press, 1971), p. 219.

[13] [28] Reichman, p. 150.

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